Governance of agrarian sustainability

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2010

GOVERNANCE OF AGRARIAN SUSTAINABILITY

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CONTENTS

PREFACE

This book presents a modern framework for understanding and improving agrarian sustainability and its governance. It incorporates the interdisciplinary New Institutional and Transaction Costs Economics (combining Economics, Organization, Law, Sociology, and Behavioral and Political Sciences), and suggests a new framework for analysis of mechanisms of governance of agrarian sustainability. Moreover, it discusses all available mechanisms affecting individual and collective actions for achieving economic, social, environmental, and intra and inter-generational goals of sustainable development including formal and informal institutions (“rules of the game”), "invisible hand of market" (market competition), individual initiatives (codes of behavior), contractual arrangements (private order), "visible hand of the manager” (fiat), collective decision-making (collective order), government intervention (public order), multinational actions (international order) and hybrid modes. The book provides effective tools for understanding, analyzing and improving public policies, business strategies, and individual and collective actions for sustainable development.

DEDICATION

This book is dedicated to my mother, my wife and my son, who all were very patient and supportive during the long years I needed to understand the agrarian governance and sustainability.

INTRODUCTION

The governance of agrarian sustainability is among the most topical issues in academic, business, and policy debates in developed, transitional, and developing countries [Daily *et al.*; EC; OECD; Raman; Salazar and Rios; UN; VanLoon *et al.*]. It is widely recognized that the achievement of economic, social, environmental, intra and inter-generational goals of sustainable development requires an effective social order (governance) and coordinated actions at various levels (individual, organizational, community, regional, national, and transnational). The governing mechanisms that could be effectively used include a mixture of "invisible hand of market" (market order), individual initiatives and contracts (private order), "visible hand of the manager" (fiat), collective decision-making (collective order), government intervention (public order), multinational actions (international order), and hybrid modes.

It is also known that the effective forms of governance of agrarian sustainability are rarely universal and there is a huge variation among different countries, regions, sub-sectors, etc. Experience shows that different societies achieve to a different extent the economic, social, environmental, etc. goals of sustainable development. That is a result of the specific governing structures which affect, in dissimilar ways, individual's behavior, gives unlike benefits, commands different costs, and leads to diverse actual performances. Despite that, institutional aspects are largely ignored and a "normative" approach dominates while the costs of governance are not included into analyses. Consequently, the potential of market and private governing modes for the specific economic, institutional and natural environment in each country, region, sub-sector and eco-system cannot be properly assessed, nor the effective modes for public (government, UN, EU, international assistance, etc.) interventions in agrarian sphere designed.

Research on mechanisms of governance of agrarian sustainability is at the beginning stage due to the "newness" of the problem, and the emerging new challenges for the governance, the fundamental modernization during the last two decades, and the "lack" of long-term experiences and relevant data. Most studies are focused on the governance of an individual (economic or social or environmental) aspect of sustainability, or on formal modes and mechanisms. What is more, they are typically restricted to a certain form (contract, cooperative, an industry initiative, or a public program), or a management level (farm, eco-system, or public), or a particular location (region).

Besides, uni-sectoral analyses are broadly used in separating the governance of farming from the governance of overall households and rural activities. Moreover, "normative" (to some ideal or external model) rather than comparative institutional approaches between feasible alternatives are employed. Likewise, the significant social costs associated with the governance, known as transaction costs, are not (or only partially) taken into consideration. Furthermore, uni-disciplinary approaches dominate, and efforts of researchers in economics, organization, law, sociology, ecology, technology, and behavioral and political sciences are rarely united to deal with that complex matter. Lastly, there are few studies on specific institutional, economic, cultural, natural, etc. factors responsible for the big variation among countries, regions, industries, and organizations.

Consequently, our understanding on the institutional, behavioral, technological, ecological, international, etc. factors of the governance of agrarian sustainability is impeded. Neither the spectrum of feasible formal, informal, market, private, public, integral, multilateral, transnational, etc. modes of governance can be properly identified, nor their efficiency (potential and limits), complementarities, and prospects of development correctly assessed. All these restrict our capability to assist improvement of public policies and modes of intervention, and to support individual, business and collective actions for sustainable development.

This book incorporates the interdisciplinary New Institutional and Transaction Costs Economics (combining economics, organization, law, sociology, behavioral and political sciences) and suggests a new framework for analysis of mechanisms of governance of agrarian sustainability.

The first part of the book discusses the modern concepts of agricultural sustainability and the economics of agricultural sustainability. After that, it presents a new framework for analysis and improvement of the governance of agrarian sustainability. This new approach takes into account the role of specific institutional environments; the behavioral characteristics of individual agents; the

transaction costs associated with the various forms of governance; the critical factors of agrarian activity and exchanges; the comparative efficiency of market, private, public and hybrid modes; the potential of farming structures for adaptation; the comparative efficiency of alternative modes for public intervention; the complementarities between different modes and the needs for multilateral and multilevel governance; and the role of technological and ecological factors.

The second part of the book identifies the specific modes for environmental governance in Bulgarian agriculture; accesses the efficiency of market, private and public forms of governance; and estimates the prospects for evolution of environmental governance and farms' sustainability in the conditions of EU CAP implementation.

This book aims to give insights on modern understanding of agrarian governance and sustainability, elaborate a holistic framework for analysis and improvement of the governance of agrarian sustainability, and test this new approach in the complicated Bulgarian agriculture. In addition, diverse (positive and negative) examples from different countries are widely used to support the arguments of the author. However, the book has no intention to provide a comprehensive picture and solution of the complex problem of agrarian governance and sustainability in the great variety of specific (market, institutional, agro-ecological, etc.) conditions around the globe.

I am enormously thankful to Nova Science Publishers, Inc. for giving me the extraordinary opportunity to present my work on agrarian governance and sustainability to the larger world audience.

PART 1. GOVERNANCE AND SUSTAINABILITY

Chapter 1

1. UNDERSTANDING AGRICULTURAL SUSTAINABILITY

1.1. CONCEPT OF AGRARIAN SUSTAINABILITY

Sustainability movements evolved in developed countries as a response to concerns about the impacts of agriculture on the depletion of non-renewable resources, soil degradation, health and environmental effects of chemicals, inequity, declining rural communities, loss of traditional values, food quality, workers' safety, decline in self-sufficiency, decreasing number of farms, etc. [Edwards *et al.*]. Very often the "sustainable" agriculture is used as an umbrella term of "new" approaches to "conventional" (capital-intensive, large-scale, monoculture, etc.) agriculture, and includes organic, biological, alternative, ecological, low-input, biodynamical, regenerative, etc. agriculture.

More recently the "social" issues such as modes of consumption and quality of life; decentralization; community and rural development; gender; intra ("North-South") and inter-generation equity; preservation of agrarian culture and heritage; improvement of nature; ethical issues (like animal welfare and the use of GM crop), etc. all have been incorporated into the sustainability concept [VanLoon *et al.*].

The 1992 Rio Earth Summit addressed the global problem of sustainable development and adopted the declaration of its "universal principles" [UN]. They comprise: rights on healthy and productive life in harmony with nature for every individual; protecting the rights of future generation; integration of environmental, social and economic dimensions at all levels; international cooperation and partnerships; new international trade relations; application of precaution approach in respect to environment; polluter liability; environmental impact assessment;

recognition of women, youth, and indigenous roles and interests; and peace protection, etc. The emergence of that "new ideology" has been associated with a considerable shift of the "traditional paradigm" of development. Besides the economic growth, the latter has incorporated a broad range of social, ethical, environmental conservation, etc. goals.

Apart from that general description, more "operational" definitions for sustainability have appeared. For instance, sustainability is often defined as a "set of strategies". Management approaches that are commonly associated with the agrarian sustainability are: self-sufficiency through use of on-farm or locally available "internal" resources and "know-how;" reduced use or elimination of soluble or synthetic fertilizers; reduced use or elimination of chemical pesticides and substitution of integrated pest-management practices; increased or improved use of crop rotation for diversification, soil fertility and pest control; increased or improved use of manures and other organic materials such as soil amendments; increased diversity of crop and animal species, reliance of a broader set of local crops and local technologies; maintenance of crop or residue cover on the soil; reduced stocking rates for animals; and full pricing of agricultural inputs and charges for environmental damages, etc. [Mirovitskaya and Ascher].

However, interpreting the sustainability as "an approach" is not always useful for "guiding change in agriculture". Firstly, the fact that some forms of agriculture are more enabling factor in ecological, social or economic sustainability (more so than in others) does not mean that sustainability is inherent to any particular set of practices, technologies, farming systems or policies. Secondly, strategies, which emerge in response to the problems in developed countries, may be inappropriate in the regions where circumstances and problems are quite different (e.g. underdeveloped, developing or transitional countries). Thirdly, it may lead to the rejection of some approaches associated with conventional agriculture, but nevertheless, enhance sustainability. Next, it makes it impossible to evaluate the contribution of a strategy of sustainability since that particular approach has already been used as a "criterion" for defining the sustainability. Finally, because of the limited knowledge during implementation of a strategy, it is likely to make errors, ignoring some that enhance sustainability or promoting others that threaten (long-term) sustainability.

Another concept that characterizes the sustainability of agricultural systems is the "*ability to satisfy a diverse set of goals through time"* [Hansen; Raman]. The goals generally include provision of adequate food (food security), economic viability, maintenance or enhancement of natural environment, some level of social welfare, etc. However, there are usually "conflicts" between different qualitative goals that creates problems of assessment. Thus, there are needs for

integration, ranking, and trade-offs. Besides, "subjectivity" of the specification of goals links the criteria for sustainability with the value of pre-set goals (e.g. the interests of stakeholders, the priorities of development agencies, the standards of analysts, etc.) rather than to the agricultural system itself. Lastly, at the low levels of analysis (parcel, farm, eco-system, sector, and region), most of the objectives are exogenous and belong to a larger system.

A number of authors interpret sustainability as the *"ability (potential) of the system to maintain or improve its functions"* [Hansen; Mirovitskaya and Ascher; VanLoon *et al.*]. Accordingly, the main system attributes that influence sustainability are specified as: resilience; survivability; profitability; productivity; quality of soil, water, and air; energy efficiency; wildlife habitat; quality of life; and social acceptance, etc. Indicators for the measurement of all these attributes are identified and their time trends evaluated. Since trends represent an aggregate response to several determinants that eliminate the need to devise aggregation schemes. –this is a sentence fragment. I would replace "Since" with "These"

Usefulness of that definition comes from suggesting operational criteria for sustainability, providing a basis for identifying constraints and evaluating various approaches to the improvement of agrarian sustainability. The most common critiques are: that it is impossible to find a single measure for different attributes; that future states of the system cannot be approximated by the past trends; and that the needs and the goals of human actors within the system are ignored.

Having in mind the constantly evolving feature of the sustainability concept and the dynamism of the agricultural system itself, sustainability is increasingly perceived as a *"process of learning about changes and adapting to these changes"* [Raman]. According to that new understanding, agricultural sustainability is always specific to a time, situation, and component, and refers to the capability of agricultural systems to evolve and endure by adapting to and accommodating changes over time and in space. Furthermore, that inbuilt dynamism of the systems also includes a feasible "finite life" (no system is sustainable forever) as an agricultural system is considered sustainable if it attains its expected life span.

We believe that sustainability has to be a criterion for guiding changes in policies, farming and consumption practice, agents' behavior, focusing of research and development priorities, etc. Therefore, the definition of sustainability has to be based on the "literal" meaning of sustainability – thus perceived as a system characteristic and *"ability to continue (maintain) over time".*

Besides, the characterization has to be "system-oriented" while the system is to be clearly specified, including its time and spatial boundaries, components, goals, and context in the hierarchy. What is more, it is to include taking into

account the adaptation potential of the major system's elements to the evolving natural and social environment. Moreover, our approach has to allow a comparative analysis of the different agricultural systems[1].

The characterization of sustainability must be also predictive since it deals with future changes rather than past and present. And finally, it should be diagnostic, and to focus on intervention by identifying and prioritizing constraints, testing hypotheses, and permitting assessments in a comprehensive way.

1.2. ECONOMICS OF AGRICULTURAL SUSTAINABILITY

The problem of sustainability has been always an important part of the economic theory. Most often it is discussed in relation to inefficiency of using common natural resources ("tragedy of commons") [Hardin], and to "negative externalities" associated with some activities [Pigou]. In recent years, it is increasingly associated with the multi-functionality (joint production character) of agriculture [OECD, 2001].

When common ownership and "open access" to natural resources exists, there is a tendency for inefficient use (or "overuse") of resources. For example, there are certain natural limits for "sustainable" exploration of a meadow for livestock farming or a pond for fishing or irrigation. The long-term efficiency (output) would decrease if the number of animals that graze or fish that are caught increases beyond these norms of an effective natural reproduction. In a one-person farm or private ownership, there will be no conflict between the efficiency and sustainability. Here, maximization of the output over time will always be achieved through "simple" production planning and management.

However, in a situation of multiple users and open access, there are strong individual interests for overusing the common resources since the private costs are not proportionate to the private benefits. In that case, individuals get full output from increasing the number of grazing animals (or fish caught), while bearing a small portion of the overall decrease in the total yield as a result of over-exploitation. Consequently, a constant overuse (non-sustainability) and low long-term efficiency comes out as a result of this form of organization of natural resources. In the modern (globalized) world, a great number of the natural and

[1] Certain authors wrongly associate the comparability with a "continues (quantitative) rather than discrete property" of a system [Hansen]. In fact, there is no reason to believe that sustainability of an agricultural system could only increase or decrease. Discrete features ("sustainable"-"non-sustainable") are possible, and of importance for the farm managers, interests groups, and policy makers [Bachev and Peeters].

environmental resources have been increasingly affected by the "tragedy of commons", and the water crisis, biodiversity crisis, global warming, etc. are top on the agenda.

Nonetheless, the *"tragedy of commons"* could be avoided by an alternative institutional arrangement [Ostron]. For instance, an introduction of a public regulation on the exploitation of natural resources, such as distribution (and enforcement) of quotas for farmers and fishermen, would maintain sustainability. In other instances, the privatization of natural resources would be an effective solution since it would create strong private incentives for the long-term preservation of resources. In the latter case, a private agent (the owner) would regulate, contract and control an effective and sustainable use of the limited natural resources.

Another classical case of "market failure" for the allocation and sustainable use of natural resources is caused by the negative externalities of certain activities. The free-market prices do not always reflect the effect on a third party's welfare, and that is why they cannot govern effectively the resource allocation and uses. For instance, the price of livestock products does not comprise the costs of the pollution of underground water by the farm activity. Since private agents (farmers and consumers of farm products) do not pay the full price of the costs associated with their activity, they are not interested in the most effective (and sustainable) use of natural resources. Maximization of the social output and welfare cannot be achieved, and an inefficient allocation and overuse of resources, and unsustainable development come out as a result. Thus, efficiency and sustainability of some elements of the system (e.g. farms) are in conflict with the efficiency and sustainability of the other elements of the system (e.g. consumers) or the system as a whole.

Therefore, an elimination of the differences between the *"social"* and *"private"* prices ("internalization of externalities") through taxes, norms, etc. is commonly suggested. Besides, various monetary and nonmonetary[2] methods for the "evaluation of environmental resources and costs" are developed and used in the analysis of overall efficiency. At the same time, the effectiveness of suggested methods is questioned because the role and services of the natural resources are not always known, and the entire "social" (present and future) value could be rarely properly evaluated. Besides, monetary assessments and dollar calculations of the majority of negative externalities (such as the adverse "impact" on human health and life; the "value" of lost biodiversity; the "exhausting" of non-

[2] E.g. eco, carbon, energy, water, etc. footprints.

renewable resources, etc.) does not often make sense since they are not socially acceptable (no "trade-off" is possible).

Coase has proved that the problem of *"social costs"* does not exist in a world of zero transaction costs and well-defined private rights [Coase, 1960]. The situation of maximum efficiency is always achieved independently of the initial allocation of rights. If, for instance, a farmer has the "right to pollute", the affected agents would pay him an appropriate "bribe" (equal to the lost income or welfare) to stop the polluting activity. If the opposite is true and the farmer does not have the "right to pollute", then the farmer would pay the appropriate bribe to other agents to let him pollute. In either case, the welfare of all agents is maximized and the maximum efficiency (known as Pareto optimum) reached without a need for any public intervention.

However, when transaction costs are significant, then costless negotiation and exchange of rights is not possible. Therefore, the initial allocation of the property rights between individuals is critical for the overall efficiency and sustainability[3]. What is more, when important rights are not well-defined, then the high costs could block the efficient use of resources and/or (mutually) beneficial exchanges. Consequently, the institutional structures for carrying out the agrarian activities become an important factor, which eventually determines the outcome of the system (the efficiency) and the type of development (sustainability) [Bachev, 2007].

"Jointness of production" is a fundamental characteristic of farming. A classic example is when a market-oriented farm produces "multiple products" such as corn and hogs, and feeds corn to the hogs. That is caused by the opportunities for a more productive use of resources (economy of scale and scope) or as a risk-reduction strategy of the farm manager (diversification, integration of critical transactions, etc.). In modern farming, there are also outputs, which are less desired such as wastes, (soil, water, air, and noise) pollution, etc.

And, finally, the farming output consists of both "private" and "public goods" such as food, rural amenities (hunting, landscape, etc.), ecological and cultural services, habitat for wildlife, biodiversity, etc. A great part of the farm's "non-commodity" outputs is "not-separable" from the major farming activities. Moreover, for these (public, quasi public, and collective) goods, no markets exist or, if they do, they function very poorly. Since these outputs are not "tradable" (profitable), farmers have no incentives to produce them on a socially-demanded scale. For the effective execution of such "public" functions of farms and for the

[3] For instance, when rights on critical resources or activities are not held by the most efficient user, development could significantly be impeded– conflicts between landlords and tenant-farmers, unproductive monopolies, etc.

production of the appropriate amount of the positive and negative externalities by the agriculture, it is necessary to develop and apply other (non-market) modes for governance [Bachev, 2007].

The division and specialization of labor, and related exchange and cooperation, opens up enormous opportunities for increasing the productivity and welfare of individuals and society[4]. It produces additional value (better resource management, bigger output, maximum economies of scale and scope) and creates incentives for deepening individual's specialization and exchanges. Furthermore, it leads to a division of traditional agrarian activity and the development of huge new sectors of the economy-agrarian research and innovation, agrarian inputs production, agricultural services, proper farming, processing of farm products, marketing of farm and food products, agrarian crediting, agrarian insurance, etc.[5]

However, it also increases (inter)dependency between individuals (demand, opportunistic behavior, and monopoly situation) and replaces or minimizes traditional "dependence from nature". What is more, today this dependency is not anymore restricted to sectoral and national borders. For example, the level of agrarian sustainability in certain countries or regions of South America, Africa and Asia is heavily dependent on the development of biotechnology, the state of the economy, and funding or demand for specific (low-cost, origins, organic, and fair-trade) products in North America and Europe.

Farming specialization is also responsible for some environmental problems in certain countries such as soil degradation (practicing constant mono culture); destruction of biodiversity; waters, soils and air pollution (enormous livestock and manure concentration); water shortages (big water demand); adverse impact of valuable eco-systems (e.g. tropical rainforests), etc.

Above and beyond, the specialization and exchange is associated with additional (transaction) costs. The genial insight of Coase is that there are "costs of using the price mechanism" [Coase, 1937] which have fundamentally reshaped modern economic thinking[6]. The high costs of outside exchange make it more profitable to carry out division and cooperation of labor (a transaction) within an organization *(*firm or group farm) instead of across the market. For instance, a specialized livestock farm internally organizes a crop (forage) production activity

[4] Economic advantages from division, specialization and cooperation of labor at national and international scales have been among the fundaments of the political economy for more than 200 years.

[5] What is more, it is estimated that growing "transacting sectors" comprise the greatest part of developed economies such as the USA [North] and Germany [Furuboth and Richter]

[6] If transaction costs were zero, then the governance of production and other (e.g. environmental preservation) activity could be done through direct interactions between individuals on market without any internal or collective organization.

(hiring additional labor and farmland) because of the significant costs and risks for market procurement of forage.

Nevertheless, the internal management of transactions is also associated with costs (for directing, stimulating and supervising hired labor; for coordination and controlling the activity of partners), which restricts the unlimited expansion of borders of an organization[7]. Thus, a transaction will be carried in an organization if the costs are lower than for governing that transaction across market or in another organization.

Consequently, the distribution of overall (agrarian) activities between different farms, organizations, and markets is determined by the comparative costs for using various governing arrangements as the most efficient one(s*)* (minimizing internal and external transaction costs) will tend to prevail [Bachev, 2004]. Ultimately, emergence, existence, evolution and the size of any free choice (contractual, economic, professional, political, etc.) organization could be explained by transaction cost minimizing (rather than technological) reason [Williamson]. Moreover, both (current) costs for using individual transacting forms and the long-term costs for their development (initiation, maintenance, modernization, and liquidation) have to be taken into account [Bachev, 2004].

The "discovery" of transaction costs significantly changed the way the economic problem ("effective allocation of resources") is addressed and solved: "Indeed it is obvious that once there is shift from a "frictionless" universe scare resources have to be used to effect transactions, protect property rights and so on. This means that system's total resource endowment can no longer be devoted solely to the production of normal commodities" [Dahlman].

The recognition of transaction costs also has a number of important policy implications. Firstly, the role of the government is to establish institutions facilitating and intensifying market and private transactions – for identification, protection, and disputing individual (absolute and contracted) rights (e.g. notary, courts, police, etc.); quality, labor, eco, etc., standards; appropriate market infrastructure (wholesale markets, market and price information), etc. Secondly, when high transaction costs impede or block otherwise efficient transactions, the government is to intervene through assistance, regulations, funding, provision, etc. to make that *socially desirable activity*[8] possible or more efficient. Thirdly,

[7] Otherwise, all agrarian activity could be managed in a single nationwide company. Actually, that experiment was made and failed in communist countries in East Europe.

[8] The particular value (and priority) that individual communities and societies give on diverse agrarian resources, activities, outputs and services are quite specific at any moment of time, and depend on socio-economic development, endowment with natural resources, culture, progress in science, public education and awareness of potential benefits and hazards, etc.

public involvement in market and private activity is to be undertaken only if there is a net benefit (saving on transaction costs) compared to total (implementation and transaction) costs of public intervention.

The principal role of the governance for the character and the pace of development is recognized (*"governance matters"*) and intensely studied [Coase; North; Furuboth and Richter; Williamson]. The specific institutional environment in which activity takes place eventually determines the level of economic performance and the sustainability in different industries, regions, countries or periods of history. The factors for the emergence and evolution of various types of institutions are quite specific for each society (community), and require a multidisciplinary analysis and explanation [North]. In the long-run, the institutions are endogenous parameters of the system and the institutional *"development"* is to be included in the model along with the economic, social and environmental components.

On the other hand, in the specific institutional environment, the "sustainability" of various market, private, collective, etc. modes of governance will depend on the comparative efficiency of the alternative governing arrangements [Bachev, 2007]. However, a high efficiency and sustainability of the different governing forms (farms, business organizations, collective actions, and public forms) does not always mean a high efficiency and sustainability of the development. As North and Williamson have proved, the history of institutional development is full of examples of "failures" while the (business) organization modernization is usually a success story [North; Williamson]. Furthermore, the high sustainability of (inefficient) public forms is a result of the high transaction costs for their reformation (political decision-making and bargaining) and/or the "inefficiency by design" making that transformation complicated [Williamson].

Today, "multi-functionality" of agriculture is socially recognized, and the sustainability is considered both as a criteria and a goal (outcome) of the development. It is also recognized that sustainability cannot be effectively achieved as a "side result" of totally decentralized actions (free market competition, contracting, and collective initiatives). The sustainable development requires effective governing and enforcement mechanisms, including a significant public involvement in market and private activities at local, national, transnational and global[9] levels.

Therefore, the analysis of the governance mechanisms for agrarian sustainability becomes essential both for defining the efficiency (potential and

[9] The term "global governance" (of security, trade, financial, environmental, etc. matters) is among the most commonly used new jargons of politicians, media, interest groups, etc.

limits) of market competition and private sector initiatives as well as for designing the most effective modes for public (governmental, international, etc.) interventions in the agrarian sector [Bachev, 2007].

Chapter 2

2. UNDERSTANDING THE GOVERNANCE

2.1. "INSTITUTIONS MATTER"

Institutions are the "rules of the game", and they determine individual's rights in society and the way the property rights[10] are enforced [Furuboth and Richter; North].

The spectrum of rights could embrace the material assets, natural resources, intangibles, certain activities, labor safety, clean environment, food security, intra- and inter-generational justice, etc. Part of the property rights are constituted by the formal laws, regulations, standards, court decisions, etc. In addition, there are important informal rules determined by the tradition, culture, religion, ideology, ethical and moral norms, etc. The enforcement of various rights is done by the state (administration, court, and police) or other mechanisms such as community pressure, trust, reputation, private modes, self-enforcement, etc.

The institutional analysis is not interested in de-jure rights but in the de-facto rights individuals and groups possess. For instance, the "universal principles" of sustainable development have been declared (1992 Rio Earth Summit) and accepted by most countries. However, the extent of adaptation, respect of related rights, and their practical enforcement vary significantly among countries.

The specific institutional environment affects human behavior and directs (governs) individuals' activities "in a predictable way" [North]. It creates dissimilar incentives, restrictions and costs for intensifying exchange, increasing productivity, inducing private and collective initiatives, developing new rights,

[10] While lawyers distinguish between property and human rights, for the economists, all rights are property rights [Furuboth and Richter].

decreasing divergence between social groups and regions, responding to ecological and other challenges.

For example, socially acceptable norms for the use of labor (employment of children, safety standards, and minimum wages), plant and livestock (animal welfare, preservation of biodiversity, and usage of GM crops), and environmental resources (water use rights and permissions for pollution), all could differ even between various regions of the same country[11]. The specific institutional structure eventually determines the potential for and the particular type of development in different communities, regions, and countries[12].

The institutional *"development"* is initiated by the public authority, international actions (agreements, assistance, and pressure), and the private and collective actions of individuals. It is associated with the modernization and/or redistribution of the existing rights, the evolution of new rights, and the emergence of novel (private, public, and hybrid) institutions for their enforcement. For instance, sustainability initially evolved as "movements" and a "new ideology" in developed countries. Afterward, this "new concept" extended and was instituted in the body of formal laws, regulations and public support programs. Numerous decentralized initiatives of producers and consumers have become wide-spread in recent years (e.g. codes of ethical behavior, organic farming, system of fair-trade, etc.), as they are an important part of (pushing up) the institutional modernization in the area.

The diverse institutional environment contributes to a different extent in achieving economic, social, environmental, etc. goals of sustainable development.

If, for instance, the private rights are not well-defined, enforced, or are restricted, then that would limit the intensification of exchange and the overall economic development. Indeed, the rights regarding major agrarian resources were not well-defined during the post-communist transition in Bulgaria and that led to the domination of low productive, unsustainable and "gray" structures, ineffective use of large national resources, and serious economic, social and environmental problems in rural areas [Bachev, 2006] The classic examples of the importance of institutional structure are associated with the previously mentioned "tragedy of commons" and negative externalities.

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[11] In Valonia, for instance, the environmental standards are much more restrictive than in the other two Belgium regions - Flandria and Brussels [Sauvenier *at al.*].

[12] A major reason for transforming the communist system was the low incentives for innovation and increasing productivity in economy based on public ownership on material, intellectual and natural capital.

In certain cases the important role of institutions on agrarian sustainability can even be observed from the sky[13].

Thus, the *"institutions matter"* and the analysis of sustainability is to be done in the specific institutional, rather than in an unrealistic ("normative"or desirable), context. The weakness of the latter approach has been strongly criticized: "The view that now pervades much public policy economics implicitly presents the relevant choice as between an ideal norm and an existing 'imperfect' institutional arrangement. This nirvana approach differs considerably from comparative institution approach in which the relevant choice is between alternative real institutional arrangements. In practice, those who adopt the nirvana viewpoint seek to discover discrepancies between the ideal and the real, and if discrepancies are found, they deduce that the real is inefficient. Users of the comparative institution approach attempt to asses which alternative real institutional arrangement seems best able to cope with the economic problem" [Demsetz].

Nevertheless, the institutional aspect is commonly missing in most of the suggested frameworks for analyzing and assessing agrarian sustainability. Accordingly, non-feasible norms, rather than the real-life arrangements, are used as criteria – e.g. the farming model in other (e.g. developed, neighboring) countries, the assumption for perfectly defined and enforced property rights, the effectively working public (local, state, and inter-governmental) organizations, etc. Therefore, an analysis of the structure and the evolution of the real or other feasible institutional arrangements for carrying out the agrarian activities has to be included in the model [Bachev, 2004].

2.3. THE MECHANISMS OF GOVERNANCE

The New Institutional Economics gives new insight on the efficiency of a diverse market, private, public and mixed modes of governance, and on their potential to deal with agrarian sustainability [Bachev, 2004; Bachev, 2007]. This

[13] For foreign visitors it was striking to see the large areas of abandoned agricultural lands and dispersed small-plots of farming during the transitional "institutional vacuum" in Bulgaria (in sharp contrast with countries with well-defined property rights). Good satellite images of "outcomes of eco-management under different institutional settings" have been presented at recent NATO ARW showing dissimilar levels of intensification of farming in both sides of USA-Mexico border [Rochon] and positive eco-results after introduction of property rights on trees in Niger in the 1990s in distinction to neighboring Nigeria [Staes].

new approach requires embracing all modes of governance affecting individual's behavior which includes:

- *the institutional environment (the "rules of the game")* – this is the distribution of rights and obligations between individuals, groups, communities and generations, and the system(s) of enforcement of these rights and rules. In modern society, a great deal of the individual's activities and relations are regulated by some (general or more specific) formal and informal rules. However, there is no perfect system of preset outside rules that can govern effectively all activities of individuals in all possible (and quite specific) circumstances of life and relations.
- *the market modes* – these are various, decentralized initiatives governed by the free market price movements and market competition (e.g. spotlight exchanges, classic contracts, production and trade of organic products and origins, system of fair-trade, etc.). The importance of the "invisible hand" of the market for the effective coordination and stimulation of individual's activities has been one of the fundamentals of the modern economy (and policies for development and globalization). However, there has also been a great number of "market failures" compromising the sustainable development, which has led to social crises, economic crises, ecological crises, energy crises, etc.
- *the private modes ("private or collective order")* – these are diverse private initiatives and specially designed contractual and organizational arrangements governing bilateral or multilateral relationships between private agents (e.g. voluntary individual or collective actions, codes of professional behavior, environmental contracts, eco-cooperatives, etc.). There has been emerging a great number of private and collective forms managed by the "visible hand of the manager",—collective decision-making, private negotiations, etc.—successfully governing various aspects (and challenges) of sustainable development. Nevertheless, there exists abundant examples of "private sector failures" (lack of potential to coordinate and stimulate sustainability), demonstrating the incapability to deal effectively with the problems of development.
- *the public modes ("public order")* – these are various forms of a third-party public (government, community, and international) intervention in market and private sectors such as public guidance, public regulation, taxation, public assistance, public funding, public provision, etc. The role of the public (local, national and transnational) governance has been increasing along with the intensification of the activity and exchange, and the growing interdependence of the social, economic and environmental

activities (and related problems and risks). In many cases, the effective organization of certain activity through a market mechanism (price competition) and/or a private negotiation would take a long period of time, be very costly, could not reach a socially desirable scale, or be possible at all. Thus, a centralized public intervention could achieve the willing state of the system faster, cheaper and/or more efficiently. Nonetheless, there has been a great number of bad public involvements (inaction, wrong intervention, over-regulation, etc.) leading to significant problems of sustainable development around the globe.

– *the hybrid forms* – some mixture combining features of the market and/or private and/or public governance (e.g. the state certifies the organic producers and enforces the organic standards, and thus intensifies the development of organic markets and environmental sustainability).

In a one-person world, there is no need for (any) governance since the sustainable relations between that person and nature are achieved through a simple (production and/or consumption) management ("self-governance"). However, in the real world of limited resources, complex social interactions between many individuals (division, specialization and cooperation of labor, and intensive exchanges) and conflicting interests, there is a need for a special governing mechanism to direct, coordinate, stimulate, induce and enforce individual's efforts to accomplish a sustainable development.

For instance, maintaining agro-ecosystem services flows[14] is an important part of sustainable agrarian development. Ensuring the effective supply of agro-ecosystem services requires appropriate behavior of individuals[15] and coordinated actions at various levels [Bachev, 2009]. According to (awareness, symmetry, strength, and harmonization costs of) interests of agents associated with agro-ecosystem services (consumers, contributors, transmitters, and interest groups), there are different needs for governing of actions (Figure 1).

[14] Humans benefit from multiple resources, products and processes supplied by natural ecosystems known as *ecosystem services* including: provisioning services (food; water; pharmaceuticals, biochemicals, and industrial products; energy; and genetic resources), regulating services (carbon sequestration and climate regulation; waste decomposition and detoxification; purification of water and air; crop pollination; pest and disease control; and mitigation of floods and droughts), supporting services (soil formation; nutrient dispersal and cycling; seed dispersal; and primary production), generation and maintenance of biodiversity, and cultural services (cultural; intellectual and spiritual inspiration; recreational experiences; and scientific discovery) [Daily].

[15] "pro-environmental" actions, "anti-environmental" inactions.

In our example, the Farm 1 has to govern its efforts and relations with Farm 2 since both receive services from Ecosystem 1 and affect (positively or negatively) the service supply of that ecosystem.

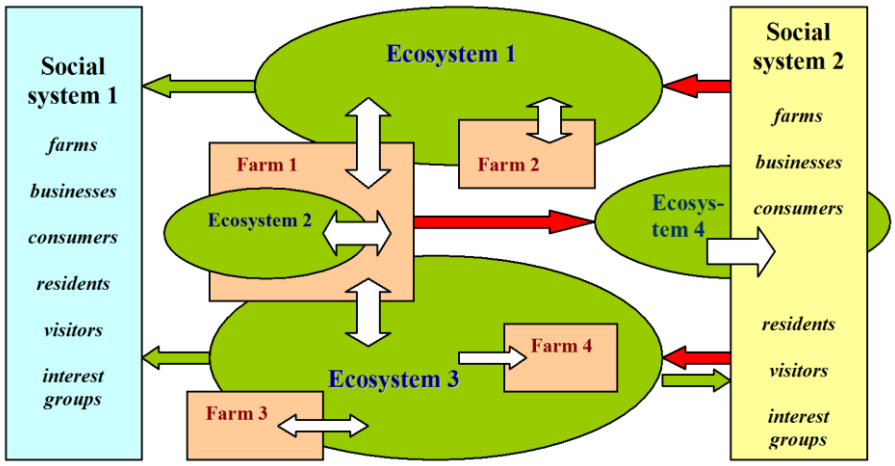

Figure 1. Governance needs for effective supply of agro-ecosystem services.

In addition, both farms are to govern their relations with consumers of services from Ecosystem 1 (agents in Social system 1) to meet the total demands and compensate the costs for maintaining ecosystem services to that direction. In addition, Farms 1 and 2 have to coordinate efforts with agents in Social system 1 to mitigate conflicts with agents in Social system 2 (negatively affecting services of Ecosystem 1). Furthermore, Farm 1 is to govern its relations with Farm 3 for effective service supply from Ecosystem 3, and manage its interaction with Ecosystem 2. Moreover, Farms 1 and 3 have to govern their relations with Farms 4 and agents from Social system 1 (consumers of services of Ecosystem 3) and Social system 2 (consumers and destructors of Ecosystem 3 services). Finally, Farm 1, adversely affecting Ecosystem 4 services, is to govern relations with agents in Social system 2 (consumers of Ecosystem 4 services) to reconcile conflicts and secure effective flow of ecosystem services. Therefore, Farm 1 is to be involved in *seven* different systems of governance in order to assure effective supply of services from ecosystems of which it belongs or affects.

Similarly, for effective governance of Ecosystem 1 services, there are *five* necessary governing modes – for coordination of actions of Farms 1 and 2; agents in Social system 1; Farms 1 and 2 with Social system 1; agents in Social system 2; and Farms 1 and 2 and Social system 1 with Social system 2.

In order to accomplish their goals and benefit from specialization and owned resources, the "rational" agents (could) use diverse modes of governance – compete and/or cooperate with each other, and/or exchange rights and resources, and/or obey to an external private, collective or public order. Thus the achievement of the state of overall efficiency (the maximum productivity, social welfare, and sustainability) is driven by various social arrangements – preset formal and informal rules (institutional environment), competition, contracting, cooperation, profit-making or non-for profit activity, collective actions, pure private order, public order, voluntary initiatives, mixed modes, etc. Depending on the efficiency of the system of governance which is put in place, the outcome of the development is quite different with diverse levels of socio-economic progression (Figure 2).

Therefore, all systems for the assessment of sustainability *must* not only include the outcome(s) of the process, that is the "current" level (the state) of sustainability. The evaluation is to embrace the system of governance put in place, the social mechanism responsible for the outcome. Otherwise, mere analysis of the state or trend indicators would give no adequate picture for the ability of the system to improve, sustain, or adapt to a new sustainable level. Thus, the problem for assessing the efficiency of individuals governing mechanisms and for selecting the most efficient one(s) is very important. The New Institutional and Transaction Cost Economics gives us a good framework to answer this key question.

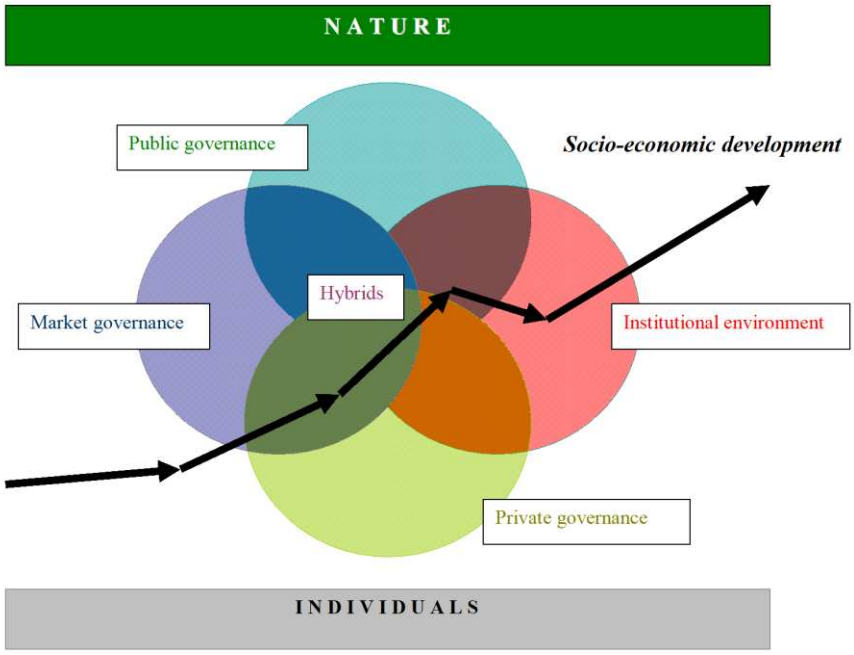

Figure 2. Governing mechanisms for agrarian sustainability.

2.3. THE COSTS OF GOVERNANCE

Transaction costs are the costs associated with the protection and the exchange of individuals' rights [Furuboth and Richter]. In addition to the production costs, the economic agents make significant costs for the coordination of their relations with other agents (individuals, private entities, and public authorities)[16]. For example, farmers have costs for finding best prices and partners for land, inputs and labor supply, financing, and marketing of outputs and services; for negotiating the conditions of exchange; for completing and "writing down" contract or setting up a partnership organization (coalition); for coordination through a collective decision-making or direct managerial orders; for enforcing negotiated terms through monitoring, controlling, measuring and safeguarding; for disputing through a court system or another way; and for adjusting or termination along with the changing conditions of exchange.

[16] The *production costs* are the costs associated with the proper technology (combination of production factors) of certain farming, servicing, environmental, community development, etc. activities. The *transaction costs* are the costs for governing the economic and other relations between individuals.

The institutional environment considerably affects the level of transaction costs of individual agents. For instance, when private rights are well-defined and protected, and (public) systems for contract enforcement work well, it facilitates transactions between individuals[17] and the effective allocation of resources. The develpoment of the institutional environment also imposes significant transaction costs to agents – e.g. studying and complying with various institutional restrictions (community or state norms, regulations, standards, etc.), formal registration of contracts and entities, efforts to deal with bureaucracy, etc. A good example in this respect are the current problems of many Bulgarian farms needing to meet the new EU requirements ("institutionally determined" costs) related to new product quality, food safety, labor, environmental, animal welfare, etc. standards [Bachev, 2008]. Furthermore, EC is increasingly criticized for imposing unnecessary regulations (and related costs) for agrarian agents such as the size, shape and color of vegetables and fruits for trade in EU, etc.

The transaction costs have two behavioral origins: individual's bounded rationality and tendency for opportunism [Williamson]. The economic agents do not possess full information about the system (price ranges, trade opportunities, adverse effects of their activities on others, or trends in development) since the collection and the processing of such information would be either very expensive or impossible (e.g. for future events, for partner's intention for cheating, time and space discrepancy between individual action and adverse impacts on others, etc.). In order to optimize decision-making (to reach the state of efficiency and sustainability) they have to spend costs for "increasing their imperfect rationality" - for data collection, analysis, forecasting, training, etc.

The individuals are also given to opportunism, and, if there is an opportunity for some of the transacting sides to get non-punishably extra rent from the exchange (performing unwanted exchange by others), he or she will likely "steal" the rights of others. Two major forms of opportunism can be distinguished: *pre-contractual* ("adverse selection") - when some of the partners use the "information asymmetry" to negotiate better contract terms—and *post-contractual* ("moral hazard") - when some counterpart takes an advantage of impossibility for full observation on his or her activities (by another partner or by a third party) or when he or she takes "legal advantages" of the unpredicted changes in transacting conditions (costs, prices, environment, etc.).

A special third form of opportunism occurs in the development of large organizations (known as "free-riding"). Since the individual benefits are often not

[17] Time and efforts for completing formalities for registration of a new company and/or for contract enforcement through the court system are often used as indicators for assessing the "business climate" in a particular country (region).

proportional to the individual efforts, everybody tends to expect others to invest costs for the organizational development and later on to benefit ("free riding") from the successful new organization [Olson].

Commonly, it is very costly or impossible to distinguish opportunistic from non-opportunistic behavior (because of the bounded rationality). Therefore, agrarian agents have to protect their transactions and rights from the hazards of opportunism through: *ex ante* efforts to protect their "absolute" (given by dominating institutions) rights, and find a reliable counterpart and to design an efficient mode for partner's credible commitments to the "contracted" (voluntary transferred) rights; and *ex post* investments for overcoming (through monitoring, controlling, and stimulating cooperation) of possible opportunism during the contract execution stage.

If transaction costs were zero, then the mode of the governance would not be of economic importance. In such a world, the individuals would manage their relations with an equal efficiency though free markets, private organizations of different types, or in a single nationwide company. All information for the effective potential of transactions (exploration of technological opportunities, satisfying various demands, and respecting assigned and transferred rights) would be available and costless. And the individuals would, for no cost, protect their (absolute and contracted) rights and trade-owned resources (and products) in mutual benefit until exhausting the possibilities for increasing productivity, maximizing the consumption, and the sustainable development[18].

However, very often the high costs make it difficult or block otherwise efficient (mutually beneficial) transactions. We have already mentioned the textbook cases of "market failure" connected with the negative and positive externalities. Since free-market prices do not reflect the effect on the third party's welfare, they cannot govern effectively the relations between individuals. The maximization of the social output (welfare) is not achieved, and inefficient allocation of resources and activities and unsustainable development arrives. Hence, farmers will over-produce "public bads" (noise, air, and water pollution) and under-produce "public goods" (rural amenities, ecological and cultural services; habitat for wildlife, and biodiversity). That necessitates a "*government intervention*" to eliminate the differences between the *social* and the *private* prices (an "internalization of externalities" through taxes, norms, etc.).

[18] Currently, there is a *principle agreement* (a "*social contract*") for a global sustainable development.

The problem of "*social costs and efficiency*" does not exist in the world of zero transaction costs and well-defined private rights[19]. However, when transaction costs are significant, then costless protection, negotiation and exchange of rights is impossible. Thus, the initial allocation of property rights between individuals is critical for the overall efficiency and sustainability. Moreover, if rights on important resources are not well-defined (e.g. rights on clean air and water, on intellectual agrarian properties, etc.), it creates big difficulties in effective allocation - e.g. unsolvable costly disputes between polluting farmers and neighborhoods; slow transfer and dissemination of agrarian innovations, etc. Consequently, some essential activities (and transactions) are not carried out at a socially effective scale, and the existing governing structures contribute less to sustainable development [Bachev, 2007].

Thus the type of the governance becomes crucial since various modes give unequal possibilities for participants to coordinate activities, and stimulate an acceptable behavior of others (counterparts and dependents), and protect their contracted and absolute rights from unwanted expropriation [Williamson]. In the world of positive transaction costs, the rational agrarian agents will seek, choose, and develop such modes for governing their activities and relations with others, which will maximize their benefits and minimize their total (production and transacting) costs. In the long run only efficient modes for governing different activities will prevail (sustain) in agriculture [Bachev, 2004].

The technological development also enormously affects the structure and level of transaction costs [North]. For instance, mechanization and standardization of farming operations (products) increases bounded rationality of manager, and diminishes possibility for opportunism of hired labor and counterparts. That leads to the extension of activities and transactions under a single management (the farm size) – enlargement of both the *internal* transactions (internal division and specialization of labor) and the *outside* market and/or contract transacting (procurement, trade, cooperation, etc.).

Possibilities that progression and application of modern production (e.g. precision farming, transportation, measurement, information, communication, etc. technologies) gives to coordinate and intensify transactions and minimize related costs are immense[20] - easy assessment and traceability; on-line information, coordination, monitoring, detecting, and advice; direct low cost exchanges (expressing demands, finding best prices and partners, negotiating, trading, and

[19] The situation of maximum efficiency is always achieved independent of the initial allocation of rights. [Coase, 1960]

[20] The traditional approach examines technology merely as a production factor. In fact, technology and its development are important transaction costs minimization factors as well.

disputing) and collective actions (coalitions) of interested agents at national and international scales; rapid detection of problems and interventions by the governments and international agencies; full participation of individuals in and control on public decision-making, etc.

However, that enormous potential for increasing productivity, effective allocation of resources, conservation of environment, and food security[21] meets the restrictions of imperfect institutional arrangements which eventually slow-down the scientific and technological progress, impede individual market and private transactions, allow particular agents (bureaucrats and interest groups) to benefit from the status-quo, and lead to unsustainable "development". For instance, it is widely recognized that the constant "food crisis" has been a consequence not of the lack of sufficient (world) technologies and resources for food production, but the result of bad governance (inefficient governments, inefficient international organizations, and inefficient global governance).

The (high) sustainability of agrarian structures is a necessary[22], but not *a* sufficient condition for sustainable development [Bachev and Peeters]. The overall goals of sustainable development cannot be automatically achieved through totally decentralized actions (free market competition and private initiatives). There is a need for a special (designed and installed) governance which includes a significant public (community, national, transnational, and global) intervention in the agrarian sector.

There is not a single (universal) mode for an effective organization of all types of agrarian activity in any possible natural, institutional, and economic surroundings [Bachev, 2004]. The individual governing forms have distinct features (different advantages and disadvantages) to protect rights and to coordinate and stimulate socially desirable activities. Besides, the agents have specific personal characteristics – different awareness, entrepreneurships, preferences, risk aversions, tendency for opportunisms, etc. Furthermore, efficiency of the governing mode will depend on the specific attributes of each activity and transaction.

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[21] The list of prospective scientific and technological innovations that are shaping agrarian sustainability and governance has been identified at recent COST Foresight 2030 Workshops [COST].

[22] According to many, the sustainability of farms is one of the major criteria (and an indicator) for sustainable agrarian development [Sauvenier *at al.*]. In fact, the experience of beef, pig, and poultry sectors of developed countries shows that financial stability (security) for farmers increases after the transformation from independent operators (traditional family farms) into hired laborers of the vertically integrated industries [Martinez; Sporleder].

Therefore, the individual transaction and the transaction costs are to be put in the center of the analysis, and the comparative efficiency of the feasible modes for governing socially desirable activities assessed [Bachev, 2007].

Chapter 3

3. IMPROVING THE GOVERNANCE

In rare cases there is only one practically possible form for governance of agrarian activity. For example, in Japanese-dispersed paddy agriculture, water supply could not have been conducted by individual farmers (high interdependency, inseparability of water use) and since the earliest period, water use organizations developed as public projects [Mori]. Similarly, in the dry lands of Israel, collection and utilization of scare rain water in farming (complementarities and inseparability of activity) has been done by community organizations for centuries now [Berkowicz].

Often the choice of the governing mode is pre-determined by institutional restrictions as some forms for carrying out farming activities, land and labor supply, trade of output, etc. could be socially unacceptable or illegal in certain countries or periods of time[23]. For instance, corporate and cooperative organization of farming is forbidden in many countries; market trade of farmland (natural resources) and some outputs (inputs) are illegitimate and private management of national ecosystems (parks and reserve zones) is not allowed, etc.

Generally, every agrarian activity and transaction could be governed through a great variety of alternative forms. For instance, a supply of environmental preservation service could be governed as: a *voluntary* activity of a farmer; through *private contracts* of the farmer with interested or affected agents; through an *interlinked contract* between the farmer and a supplier or a processor; through a *cooperation* (collective action) with other farmers and stakeholders; through a (free) *market* or assisted by a *third-party* (a certifying and controlling agent) *trade*

[23] Nevertheless, when transaction costs associated with illegitimate governance is not high (possibility for disclosure low, enforcement and punishment insignificant) and benefits are considerable, then the more effective modes prevail – large gray or black sectors of economy are common around the globe.

with special (eco, protected origins, and fair-trade) products; through a *public contract* specifying the farmer's obligations and compensation; through a *public order* (regulation, taxation, and quota for use of recourses or emissions); within a hierarchical *public agency*; or by a *hybrid* form.

The different governance modes are alternative but not equal modes for the organization of activities. Each of them has distinct advantages and disadvantages to protect rights, and coordinate and stimulate socially desirable activities.

The *free market* has a big coordination and incentive advantages ("invisible hand of market" and "power of competition"), and provides "unlimited" opportunities to benefit from the specialization and the exchange. However, market governance could be associated with a high uncertainty, risk, and costs due to the price instability; the great possibility for facing an opportunistic behavior; the "missing market" situation, etc.

The s*pecial contract form* ("private ordering") permits a better coordination, intensification, and safeguard of transactions. However, it may require large costs for the specification of contract provisions, for adjustments with constant changes in the conditions, for enforcement and disputing of negotiated terms, etc.

The *internal (ownership) organization* allows a greater flexibility and control on transactions (direct coordination, adaptation, enforcement, and dispute resolution by a *fiat*). However, the extension of the internal mode beyond the family and small-partnership boundaries (allowing achievement of the minimum technological or agronomic requirements and exploration of technological economies of scale and scope) may command significant costs for development (initiation and design, formal registration, and restructuring), and for current management (for collective decision making, control on the coalition members opportunism, supervision and motivation of hired labor, etc.).

Separation of ownership from management (cooperative, corporation, and public firm/farm) gives enormous opportunities for growth in productivity and transacting efficiency – internal division and specialization of labor; exploration of economies of scale and scope; introduction of innovation; diversification; risk sharing; and investing in product promotion, brand names, relations with customers, counterparts and authorities. However, it could be connected with huge transaction costs for decreasing information asymmetry between management and shareholders, in decision-making, in controlling opportunism, and in adaptation. *Cooperative* and *non- profit form* also suffer from low capability for internal long-term investment due to non- profit goals and non-tradable character of shares (so called "horizon problem").

In order to select the best (most efficient) form for governing a particular activity, we have to assess the comparative advantages and disadvantages of practically possible forms for governance of that activity.

In some cases the advantages of a certain mode of governance are not difficult to verify - e.g. when it gives bigger benefits (achieves the socially desirable/effective scale) or commands minimum total costs, etc. In such cases the choice of the most effective form of governance is easy since we can directly compare the costs and the benefits of alternatives. For instance, in most countries, much of the agrarian activity is commonly governed in some sort of family farm, the supply of inputs or exchange of farm outputs are governed by market modes, etc.

However, in many instances, the direct assessment (the comparison) of the costs and the benefits of the alternative governing arrangements are difficult or impossible to make. That is particularly true for some elements of the transaction costs related to diverse governance structures[24]. In the latter group we can include the costs for finding the best partners for negotiation, for controlling and enforcement of contractual terms, for organizational development, for interlinked transacting, for unrealized (failed) deals, etc. [Bachev, 2004]. Besides, it is often extremely complicated to separate transaction costs from traditional production expenditures[25]. For example, while executing farming operations, a farmer supervises hired labor. During transportation of chemicals, he negotiates marketing of output, etc.

What is more, component comparisons of transacting costs cannot always give an idea for efficiency of organizations. Very often the alternative form *decreases one type* of cost while *increasing another type* of transaction costs – e.g. internalization of a transaction (replacement of market with integral mode) is associated with reduction of costs for information supply (overcoming market uncertainty), permanent (re)negotiations along with constantly changing conditions, and safeguarding investments from outside opportunism. On the other hand, it enlarges costs for organizational formation, decision making, integral management, supervising and motivation of hired labor, etc.

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[24] Data for some part of transaction costs can be found in traditional statistics, accountancy, and project documentation – e.g. costs for licensing and registration, agro-market information, promotion and marketing of output, general management, hiring lawyers and court suits, guarding property and yields, purchase of insurance against social hazards, payment of bribes, etc.

[25] All these *"measurement problems"* make it impossible to extend the traditional Neoclassical models simply by adding a new "transacting activity" [Furuboth and Richter].

Moreover, a good part of transactions in agriculture is governed not by "pure" modes, but through *complex* or *interlinked modes* - e.g. using a multipurpose cooperative for inputs supply and marketing for a private farm; input supply in a "package" with know-how, extension or/and service supply; joint supply of inputs and credit; crediting of production against marketing of output, etc.

Thus, it is important to take into consideration *overall* (total) costs for organization of transactions of different types - all external and internal transaction costs of an organization.

Often it is difficult to select a base for comparison in view that the high transaction costs entirely block development of alternative organizations. For instance, the market for agrarian credit did not emerge in East Europe during most of the transition and internal supply (utilization of own finance and direct outside co-investment was the only possible form for finance supply of farms) [Bachev, 2006]. Here the comparative level of transaction costs is impossible to be determined and the "high" efficiency of the integral mode for finance supply appreciated. In that case, funding with one's "own means" and with "bank credit" are not real alternatives at all, but completely different governing structures[26].

The discrete structural analysis is suggested to evaluate the *comparative efficiency* of the alternative governing forms [Williamson]. Here the assessment of the absolute levels of transaction costs of the alternative governing structures is not necessary. This approach aims to evaluate the *relative* levels of transaction costs between alternative modes of governance and selecting that one which most economizes transaction costs.

Following that framework, first we have to identify the *"critical dimensions"* of transactions responsible for the variation of transaction costs. The "frequency", "uncertainty", and "asset specificity" have been identified as critical factors of the transaction costs by Williamson [Williamson] while the "appropriability" has been added by Bachev and Labonne [Bachev and Labonne].

When the recurrence of transactions between the same partners is high, then both (all) sides are interested in sustaining and minimizing costs of their relations (avoiding opportunism, building reputation, setting up adjustment mechanisms, etc.). Besides, the costs for the development of a special private mode for facilitating bilateral (or multilateral) exchange could be effectively recovered by frequent exchange.

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[26] Thus, broadly applied in the west, indicators for estimation of comparative efficiency of investments based on "opportunity costs" (discounting, payback period, and internal rate of return) independent from the form of funding have no significant economic sense in transitional conditions.

When the uncertainty which surrounds transactions increases, then costs for carrying out and securing the transactions go up (for overcoming information deficiency, safeguarding against risk, etc.). Certain risks could be diminished or eliminated by a production management or through a special market mode (e.g. purchasing insurance). However, the governance of most transaction risk would require special private forms – e.g. trade with origins; providing guarantees; using share-rent or output-based compensation; employing economic hostages; participating in a risk-pooling, inputs-supply or marketing cooperative; or a complete integration [Bachev and Nanseki].

The transaction costs get very high when specific assets for the relations with a particular partner are to be deployed [27]. The relation specific investments are "locked" in transactions with a particular buyer or seller, and cannot be recovered through a "faceless" market trade. Therefore, dependant investment (assets) have to be safeguarded by a special form such as long-term contracts, interlinks, hostage taking, joint investments, or ownership integrations.

The transaction is particularly difficult when the appropriability of rights on products, services or resources is low. "Natural" low appropriability has most of the agrarian intellectual products - agro-market information, agro-meteorological forecasts, new varieties and technologies, software, etc. Besides, all products and activities with significant (positive or negative) externalities are to be included in this group. If the appropriability is low, the possibility for unwanted (market or private) exchange is great, and the costs for protection of private rights (safeguarding, detecting cheating, and disputing) is extremely high. The agents would either overproduce (negative externalities) or under-organize such activity (positive externalities) unless they are governed by an efficient private or hybrid mode (cooperation, strategic alliances, long-term contract, trade secrets, or public order).

Secondly, we have to "*align* transactions (differing in their attributes) with the governance structures (differing in their costs and competence) in discriminating (mainly in transaction cost economizing) way" [Williamson]. According to the combination of the specific characteristics of each transaction, there will be different the most effective form for governing of activity (Figure 3).

Agrarian transactions with a good appropriability, high certainty, and universal character of investments (the partner can be changed anytime without significant additional costs) could be effectively carried across the free market

[27] Specificity is not a technological but *transaction* characteristic of the assets. In one situation a particular capital (investment) could be highly *universal* (easy deployment to another internal usage or outside trade) while in others,highly *specific* (a big dependency from the relations with a certain counterpart - buyer or seller).

through *spotlight* or *classical contracts*. Here the organization of transactions with a special form or within the farm (firm) would only bring extra costs without producing any transaction benefits.

Generic modes	*Critical dimensions of transactions*								
	Appropriability								
	High								*Low*
	Assets Specificity								
	Low				*High*				
	Uncertainty								
	Low		*High*		*Low*		*High*		
	Frequency								
	High	*Low*	*High*	*Low*	*High*	*Low*	*High*	*Low*	
Free market	♈	♈							
Special contract form			♈			♈			
Internal organization					♈		♈		
Third-party involvement				🚑				🚑	
Public intervention									🚑

♈ - the most effective mode; 🚑 - a necessity for a third party involvement.

Figure 3. Principle modes for governing of agrarian transactions[28].

The recurrent transactions with low assets specificity, and a high uncertainty and appropriability, could be effectively governed through a *special contract*. The *relational contract* is applied when detailed terms of transactions are not known at outset (a high uncertainty), and a framework (mutual expectations) rather than a specification of the obligations is practiced. The partners self-restrict from opportunism and are motivated to settle the emerging difficulties and continue relations (the situation of a frequent bilateral trade). Besides, no significant risk is involved since investments could be easily (freely) redeployed to another use or users (no assets dependency exist).

A special contract form is also efficient for rare transactions with a low uncertainty, high specificity and appropriability. The dependent investment could be successfully safeguarded through the contract provisions since it is easy to

[28] The differences in the personal characteristics of the agents are disregarded. Only the extreme levels (high-low) of the critical factors of transactions are considered. In the real agrarian economy, there is a big variation of the critical dimensions, and thus of the effective governing forms (including mixed, hybrid, interlinked, etc. governance).

define and enforce the relevant obligations of partners in all possible contingencies (no uncertainty surrounds transactions). Here the occasional character of the transactions does not justify the internalization within the farm (firm).

The transactions with a high frequency, a big uncertainty, large assets specificity (dependency), and a high appropriability, have to be organized within the farm/firm (the internal ownership mode). For instance, the managerial and the technological knowledge is quite specific to a farm, and its supply has to be always governed through a permanent labor contract and coupled with the ownership rights [Bachev, 2004]. The capital investments in land are to be made or owned (or long-leased) rather than a seasonally-rented land (high site and product specificity). All "critical" to the farm material assets will be internally organized - production of forage for animals; important machineries; water supply for the irrigated farming, etc. While the universal capital could be effectively financed by a market form (e.g. a bank credit), the highly specific investments can be only made through internal funding (own funds, equity sell, and joint venture).

According to the personality of resource owners (capability, experience, and preferences) and the (transacting) costs of their coalition, different type of farm (agro-firm) will be efficient - one-person farm, family farm, partnership, cooperative farm, and corporative farms [Bachev, 2004]. If the specific and specialized capital cannot be effectively organized within the farm (economy of scale and scope explored, and funding made)[29], then an effective governing form outside farm-gates is to be used - group farming, joint ownership, interlinks, cooperative, or lobbying for a public intervention.

When the strong assets (capacity, time of delivery, site, and branding) inter-dependency with an upstream or downstream partner exists, then it is not difficult to govern transactions through a contract mode (strong mutual interests for cooperation and restriction of opportunism). For instance, effective eco-contracts between farmers and interested businesses (symmetrical dependency) are widely used in developed countries,[30] leading to production methods (enhanced pasture management, reduce use of agrochemicals, and wetland preservation) protecting water from pollution.

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[29] The integration of transactions would either increase the management costs (need to buy from or sell to a competitor) or it would be loss-making compared to the outside production costs (price) competition.

[30] e.g. drinking water companies in Germany [Hagedorn], and the mineral water company Vittel in France [Hanson *et al.*]. We have also discovered such agreements between farmers and Sony Corporation in the Kumamoto region in Japan.

However, very often farmers face a *unilateral dependency* and need an effective (ownership) organization to protect their interests. The transaction costs for initiation and maintenance of such "collective organizations" is usually great (big number of the coalition, different interests of the members, and opportunism of "free-riding" types) and it is either unsustainable or does not evolve at all. That creates serious problems for the efficiency (and sustainability) of individual farms - missing markets, monopoly or quasi-monopoly situation, impossibility to "induce" a public intervention, etc.

Thirdly, we have to identify the situations of *market* and *private* sector failures – that is the critical point for the sustainable development. Serious transaction problems arise when the condition of assets specificity is combined with a high uncertainty, low frequency, and good appropriability (Figure 2). Here the elaboration of a special governing structure for a private transacting is not justified, the specific investments are not made, and the activity (or restriction of activity) fails to occur at an effective scale ("market failure" *and* "contract failure"). Similar difficulties are also encountered for rare transaction associated with a high uncertainty and appropriability.

In all these cases, a third part (private agent, NGO, or public authority) involvement in transactions is necessary (through assistance, arbitration, and regulation) in order to make them more efficient or possible at all. For instance, when a state establishes and enforces quality and safety standards for farm inputs (chemicals and machinery) and products, or certifies providers of agrarian services, or regulates employment relations, or guarantees a minimum price for farmers, all that considerably facilitates and intensifies (market and private) transactions and increases farm sustainability. The emergence and unprecedented development of the organic farming and the system of fair-trade are also good examples in that respect. There is an increasing consumer's demand (a price premium) for the organic, semi-organic and fair-trade products in developed countries. Nevertheless, their supply could not be met unless effective *trilateral governance* (including an independent certification and control) has been put in place.

When the appropriability associated with a transaction is low, there is no pure market mode to protect and carry out that activity effectively. Nevertheless, respecting others rights (unwanted exchange avoided) or *"granting"* additional rights to others (needed transactions carried) could be governed by the *"good will"* or *charity actions* of individuals, NGOs, governments or international organizations. For instance, a great number of voluntary environmental initiatives (agreements) have emerged driven by the competition in the food industries,

farmers' preferences for eco-production, and the responses to the public pressure for sound environmental management[31].

However, the environmental standards are usually "process-based", and "environmental audit" is not conducted by an independent party, which does not guarantee a "performance outcome". Therefore, most of these initiatives are seen as a tool for the external image manipulation. Recent huge food safety, animal safety, and eco-scandals have demonstrated that such private schemes could often fail (result of the high-bounded rationality and possibility for opportunism).

In any case, the voluntary initiatives could hardly satisfy the entire social demand, especially if they require significant costs. Some *private modes* could be employed if a high frequency (a pay-back on investment is possible) and a mutual assets dependency (thus an incentive to cooperate) exists[32]. In these instances, unwritten accords, interlinking, bilateral or collective agreements, close-membership cooperatives, codes of professional behavior, alliances, internal organization, etc. are used.

However, the emergence of special (private) large-member organizations for dealing with low appropriability (and satisfying the entire "social" demand) would be very slow and expensive, and they will unlikely be sustainable in the long run (because of the "free riding" problem). Therefore, there is a strong need for *a third-party public* (government, local authority, international assistance, etc.) *intervention* in order to make such activity possible or more effective [Bachev, 2004].

For example, the supply of environmental goods by farmers could hardly be governed through private contracts with the individual consumers because of the low appropriability, high uncertainty, and rare character of transaction (the high costs for negotiating, contracting, charging all potential consumers, disputing, etc.). At the same time, the supply of additional environmental protection and improvement service is very costly (in terms of production and organization costs) and would unlikely be carried out on a voluntary basis. Besides, the financial compensation (price-premium) of farmers by the willing consumers through a pure market mode is also ineffective due to the high information asymmetry, massive enforcement costs, etc. A third-party mode with a direct public involvement would make that transaction effective: on behalf of the consumers, the state agency negotiates with the individual farmers a contract for

[31] Unprecedented development of the "codes of behaviors", eco-labeling and branding, environmental cooperatives, and "green alliances" are all good examples in that respect.

[32] For instance, inter-dependency between a dairy farm and a milk processor in a remote region (capacity and site dependency); or a bee keeper and a neighboring orchard farm (symmetric dependency between needs of flower and needs for pollination).

"environment conservation and improvement service", coordinates activities of various agents (including a direct production management), provides public payments for the compensation of farmers, and controls the implementation of negotiated terms[33].

3.2. ASSESSING SUSTAINABILITY OF FARMS

A significant amount of the agrarian activities is organized by different types of *farms* and *farming organizations*. The New Institutional Economics gives new insight for understanding the role of the farm and its sustainability [Bachev and Peeters]. The sustainability of a farm is to characterize a farm's ability to maintain (continue) over time. Since no economic organization would exist in the long-term if it were not efficient (otherwise it would be replaced by a more efficient arrangement), the problem of assessment of sustainability of farms is directly related to the estimation of the factors and the level of farm efficiency.

In the traditional (Neoclassical) framework, the farm is presented as a *"production structure"* and the analyses of efficiency are restricted to the *production costs* ("factors productivity" and "optimization of technological factors according to marginal rule"). This approach fails to explain why (in any given country) for a long period of time there exists so many farms with different levels of "efficiency" (productivity). In Bulgaria for instance, the level of profitability and productivity in cooperative farms has been 5 times lower than in private farms. Besides, there has been one million highly sustainable subsistent and non-profit making farms in the country [Bachev, 2006].

In addition to the production costs, the modern farm is also associated with significant *transaction costs*. Therefore, the "rational" agrarian agents will seek, chose and/or develop the most effective (less expensive) mode for organization of their transactions that minimize their bounded rationality, and safeguard their investments and rights from the hazards of opportunism. When transaction costs are high, they could block otherwise effective transactions, and restrict the farm size far below the technologically optimal level. Very often the high costs for market trading (e.g. finding a credit and marketing of output) and/or internal governance (e.g. deficiency of low transacting cost labor) limit the farm size to miniature subsistent farming or family borders [Bachev, 2004]. In other instances,

[33] Namely, *public environmental contracts* with individual farmers have been broadly used in EU as an effective form for governing the supply of environmental preservation and improvement services [EC].

the existing effective potential to economize on market transaction costs could cause a vast extension of farm size through a backward, lateral or forward integration of transactions.

For example, the high costs for market and contract trading after 1990 has turned the subsistent farming into the most effective (or only possible) form for organization of available agrarian assets (farmland, livestock, etc.) of more than a million Bulgarians (Bachev, 2006). On the other hand, the enormous costs of market trading have caused a domination of integrated and interlinked modes of transacting, and a concentration of commercial farming in a few thousand large agro-firms and cooperatives.

Thus, in the world of positive transaction costs, farms and other agrarian organizations have a significant economic role to play. They are not only production but also a major governing structure – a form for organization of transactions and for minimization of transaction costs. Therefore, sustainability of different farms cannot be correctly understood and estimated without analyzing their comparative production and governance potential [Bachev and Peeters].

Generally, every farm related transaction could be governed through a great variety of alterative market, contract, integral, etc. forms. Each of these governing modes gives individuals dissimilar opportunities to coordinate, stimulate, and control transactions, safeguard their investments from an opportunistic expropriation, and profit from the specialization, cooperation and exchange.

For instance, a *one-person farm* (firm) has zero internal transaction costs (one agent), but limited possibility for investment in specialized (and specific) human and material capital. The “internal” opportunities for increasing productivity (through investments and exploring economy of scale and size) increases along with the extension of the members of a *coalition* (group farm or partnership). However, the latter is also associated with an enlargement of the costs for making the coalition (finding complementary and reliable partners) and the internal costs for managing the coalition (for coordination, reducing bounded rationality, controlling opportunism, etc.).

The separation of ownership from the management (cooperative or corporation) gives enormous opportunities for productivity growth, but it is connected with huge transaction costs (for decreasing information asymmetry between management and shareholders, for decision making, for adaptation, for controlling opportunism of hired labor and between partners, etc.).

The special contract form combines the potential for a greater "control" on transactions with the possibility to explore advantages of further specialization of activity. Nevertheless, it could be connected with large costs for preparing and

enforcement of contracts for complex occasional transactions with high unilateral dependency.

A free market has a big coordination and large incentive advantages ("invisible hand" and "power of competition") and provides "unlimited" opportunities to benefit from specialization and exchange. However, market governance could be associated with high uncertainty, risk, and costs due to price instability, great possibility for facing opportunistic behavior, "missing market" situations, etc.

Protection of rights and economic exchanges results in the more profitable use of resources, but also requires additional costs. Farmers and other economic agents (resource owners, consumers) will tend to govern their activity and relations though the most effective forms – that which will maximize their benefits and minimize their costs. Therefore, the most effective form and size of farm will be determined through *optimization of total (*production and transacting*) costs,* and *trade-offs* between the gain in the productivity/benefits and the gain in transacting costs.

Hence, a farm will be efficient (sustainable) if it manages all transactions in the most economical for the owner(s) way – that is the situation when there exists no activity which could be carried out with a net benefit [Bachev, 2004]. If a farm does not govern activity **or** transactions effectively, it will be unsustainable since it experiences high costs and difficulties using institutions (possibilities and restrictions) and carrying out activity and transactions compared to other feasible organizations. In that case, there will be strong incentives for exploring the existing potential (adapting to a sustainable state) through reduction or enlargement of farm size, or via reorganization or liquidation of the farm. Thus, either alternative farm or non-farm application of resources; or farm expansion through an employment of additional resources; or trade instead of internal use of owned land and labor; or taking over by (or merger with) another farm or organization[34] will take place.

Furthermore, the transacting modes and the acceptable net benefits will vary according to the *individual's preferences, entrepreneurship ability, risk aversion, opportunity costs of owned resources, etc.* Depending on the personality of resource owners and the (transaction) costs and benefits of their coalition, *different types of farm* will be preferred - *one-person* farms (firms), *family* farms (firms), *group* farms or *partnership* (firms), *cooperative* farms, and *corporative* farms [Bachev, 2004]. Expected benefits for farmers could range from the

[34] In the most developed countries, the sustainable development has been associated with the disappearance of the traditional farming organization in major sectors (poultry, beef, and pig) which has been taken over by or integrated into related industries.

monetary or non-monetary income to profit to indirect revenue to pleasure of self-employment or family enterprise to enjoyment of agricultural activities to desire for involvement in environment, biodiversity, or cultural heritage preservation to increased leisure and free time, to other non-economic benefits[35].

Moreover, in the specific institutional environment (legal framework, support policies, tradition, access to new technology, and level of transaction costs), various types of farms will have quite different effective *horizontal and vertical boundaries*.

For instance, in *transitional* conditions of high market and institutional uncertainty and inefficient property rights and contract enforcement system, most of the agrarian investments happened to be in a regime of high specificity (dependency).

As a result, (over)integrated modes such as low productive subsistent households and group farming, or large production cooperatives and agro-companies, have been dominating in Bulgaria and East Europe [Bachev, 2006]. Alternatively, in more matured economies, where markets are developed and institutions stable, the agrarian assets are with more universal character. Therefore, farm borders are greatly determined by the family borders, and more market and mixed (contract rather than entirely integrated) forms prevail.

In order to assess the farm's efficiency and sustainability, we have to put the *individual* transaction in the *centre of analysis*, and assessed the level of associated costs and benefits. The major types of farm transactions are associated with:

- know-how supply,
- innovation supply,
- supply of land and other natural resources,
- labor supply,
- inputs supply,
- service supply,
- finance supply,
- insurance supply,
- marketing of services and products.

Specific forms for governing of transactions in major functional areas of Bulgarian farms at the current stage of development are presented in Figure 4.

[35] A "desire for preservation of the farm for future generation" has been a major reason for the persistence (sustainability) of a great number of part-time farms in Japan [Bachev and Petters].

Functional areas	Alternative governing modes		
	Market contract	*Special contract form*	*Special organization*
Supply of land and other natural resources	Purchase Short-term lease	Long-term lease with a fix rent Long-term lease with a share rent Long-term lease with a market rent	Cooperation Partnership
Labor supply	Daily hire Seasonal hire	Permanent labor contract with a fix remuneration Permanent labor contract with result based payment	Partnership Cooperation
Supply of short-term material assets	Purchase with a spotlight contract Standard contract	Long-term procurement contract Supply contract interlinked with a credit supply, service supply, and/or marketing of farm produce	Cooperation
Supply of long-term material assets	Purchase with a spotlight contract Standard contract	Long-term lease contract Contract for purchase interlinked with crediting (leasing) and/or services	Partnership Cooperation
Service supply	Purchase with a spotlight contract Standard contract	Long-term supply contract Supply contract interlinked with other services, products or crediting	Partnership Cooperation
Innovation and know-how supply	Purchase with spotlight contract Standard contract Free consultation in the farm advisory system	Long-term supply contract Supply contract interlinked with supply of material assets and/or crediting	Cooperation
Financing	Bank loan Loan from an individual agent Loan from a private organization	Co-investment Crediting interlinked with supply of material assets and services Contract with a public funding program	Partnership Cooperation
Insurance	Purchase of insurance Purchase of "assurance service"	Insurance contract interlinked with material assets Long-term insurance contract	Cooperation
Marketing of products and services	Retail sale Wholesale trade Standard contract	Long-term contract for marketing Marketing contract interlinked with crediting, supply of material assets and/or services	Partnership Cooperation

Figure 4. Principle governing forms for functional areas of Bulgarian farms.

The analysis is to embrace the comparative efficiency of the organization (governance) of every major transaction of the farm. If significant costs (difficulties) of some types of transacting in relation to the feasible alternatives are in place, then the farm is to be considered as non-sustainable. Given the fact that an alternative form often diminishes one type while increasing the other kind of transaction costs, and the widespread application of complex modes (e.g.

interlinking credit supply with inputs supply and/or marketing), the overall (internal and external) governance costs of the farm has to be taken into account.

Next, the farm's potential (incentives and ability) for adaptation to the evolving market, institutional and natural environment through effective changes in the governing forms (saving on transaction costs) and the production structure (exploring technological possibilities for growth in productivity) is to be estimated. Thus, if a farm does not have a potential to stay at or adapt to new more sustainable level(s), it would be either liquidated or transformed into another type of farm.

For instance, if a farm faces enormous difficulties meeting institutional opportunities and restrictions (e.g. new quality and environmental standards and production quotas); or it has serious problems supplying managerial capital (as it is in a one-person farm when an aged farmer has no successor), or supply of needed farmland (a big demand for non-agricultural use of land), or funding activities (insufficient own finance and impossibility to sell equity or buy credit), or marketing output (a changing demand for certain products and strong competition with the imported products), then it would not be sustainable despite the high historical or current efficiency. Currently there are numerous unsustainable farms in most EU countries, which can hardly adjust to the fundamental changes in CAP and associated and enhanced competition and new food safety, environmental, animal welfare, etc. standards.

Our new approach makes it clear that sustainable development does not mean sustainable farms and agrarian structures [Bachev and Peeters]. The farms and other modes of governance *evolve* (modernize, adapt, transfer, and disappear) according to the changes in the social and natural environment. The development of the governance must be judged depending on the contribution of dominating and newly emerging forms of governance to achieving various (social, economic, environmental, etc.) goals of sustainable development.

Our approach also proves inadequacy of widely used indicators for productivity of "production costs and resources" for the assessment of the efficiency (viability and sustainability) of different farming organizations. Actually, significant differences are to be expected in the rate of profitability on investments in an agro-firm (a "profit making organization") from the "pay-back" of expenditures and resources in a cooperative ("member oriented organization"), a public farm (a "non-for profit organization") or in a self-consistent farm (giving opportunity for productive use of otherwise "non-tradable" resources such as family labor, land, etc.) [Bachev, 2004].

It is obvious that traditional, statistical accountancy and other data are little suitable to test and broadly apply our new approach for assessing efficiency (and

sustainability) of farms. Here it is necessary to get *micro-economic* data for the different transactions governed by various types of farms as well as for the costs and benefits associated with alternative governing structures.

3.3. IMPROVING MODES OF PUBLIC INTERVENTION

There is a big variety of possible forms for public intervention in the market and private activities. The *comparative* analysis is to extend to the public modes and include: firstly, the *correspondence* of the public involvement to the real needs of development – the *identified needs for a third-party intervention* from Figure 3.

Secondly, it needs to include an assessment of the *comparative* advantages of the alternative modes for public involvements comprising *all costs* – the direct (tax payer, assistance agency, etc.) expenses, and the transacting costs of bureaucracy (for coordination, stimulation, and mismanagement), and the costs for individuals' participation and usage of public modes (expenses for information, paper works, payments of fees, and bribes), and the costs for community control over and for reorganization of the bureaucracy (modernization and liquidation of public modes), and the (opportunity) costs of public inaction.

And thirdly, it needs to include an estimation of the *comparative efficiency* of selected form and the other practically possible (*feasible)* modes of governance of socially desirable activity such as partnership with private sector; property rights modernization, etc. Accordingly, a public intervention is to be initiated *only* if there is overall *net benefit* - when the effects are greater than additional (individual and social) costs for the third-party involvement [Bachev, 2007].

Depending on the uncertainty, frequency, and necessity for the specific investment of public involvement, there will be different effective forms. Figure 5 presents an example with the public modes for effective interventions in the "environmental transactions".

Principally, the interventions with a low uncertainty and assets specificity would require a smaller government organization (more regulatory modes, improvement of the general laws and contract enforcement, etc.). When uncertainty and assets specificity of the transactions increases, a *special contract mode* would be necessary – e.g. employment of public contracts for provision of private services, public funding (subsidies) of private activities, temporary labor contract for carrying out special public programs, leasing out public assets for private management, etc. And when transactions are characterized with a high assets specificity, uncertainty and frequency, an *internal mode* and a *bigger public organization* would be necessary – e.g. permanent public employment contracts,

in-house integration of crucial assets in a specialized state agency or public company, etc.

Level of Uncertainty, Frequency, and Assets specificity				
Low ←----------				----------→ *High*
New property rights	**Regulations**	**Taxes**	**Assistance and support**	**Public provision**
Rights for clean, beautiful environment, biodiversity; Private rights on natural, biological, and environmental resources; Private rights for (non) profit management of natural resources; Tradable quotas (permits) for polluting; Private rights on intellectual agrarian property, origins, (protecting) ecosystem services; Rights to issue eco-bonds and shares; Private liability for polluting	Regulations for organic farming; Quotas for emissions, and use of products and resources; Regulations for introduction of foreign species, and use of GM crops; Bans for certain activity, and use of some inputs and technologies; Norms for nutrition and pest management; Regulations for water protection against pollution by nitrates; Regulations for biodiversity and landscape management; Regulations for trading of protection of ecosystem services; Licensing for water or agro-system use; Quality and food safely standards; Standards for good farming practices; Mandatory (environmental) training; Certifications and licensing; Compulsory environmental labeling; Designating environmental vulnerable and reserve zone; Set aside measures; Inspections, fines and, ceasing activities	Tax rebates, exception, and breaks; Environmental taxation on emissions or products (pesticides, fertilizers); Levies on manure surplus; Tax or levies schemes on farming or export for funding innovations and extension; Waste tax	Recommendation and information; Demonstration; Direct payments and grants for environmental actions of farms, farmers and community organizations, businesses; Preferential credit programs; Public environmental contracts; Government purchases (water and other limited resources); Financial and price support for organic and eco-production, and special origins; Funding of environment and management training programs; Assistance in farm and eco-associations Collecting fees for paying eco-system service providers	Research and development; Extension and advise; Agro-market and know-how information; Agro-meteorological forecasts; Sanitary and veterinary control, vaccination, prevention measures; Specialized public agency (company) for important ecosystems; Pertaining "precaution principle" Eco-monitoring; Eco-foresight; Risk assessment

* The environmental transactions are associated with respecting the environmental rights and improving the environmental performance of individual agents.

Figure 5. Effective modes for public intervention in environmental transactions*.

In the beginning, the *existing* and *emerging problems* (difficulties, costs, risks, and failures) in the organization of market and private transactions have to be specified. The appropriate government involvement would be to create an environment for: decreasing the uncertainty surrounding market and private transactions, increasing the intensity of exchange, protecting private rights and investments, and making private investments less dependent, etc. For instance, the state establishes and enforces quality, safety and eco-standards for farm inputs and products, certifies producers and users of natural resources, regulates employment

relations, transfers water management rights to farms associations, sets up minimum farm-gate prices, etc. All of that facilitates and intensifies (market and private) transactions and increases sustainability.

Next, practically possible modes for increasing appropriability of transactions have to be considered. The low appropriability is often caused by unspecified or badly specified private rights [Bachev, 2004]. In some cases, the most effective government intervention would be to introduce and enforce *new private property rights* – e.g. rights on natural, biological, and environmental resources; rights on issuing eco-bonds and shares; marketing and stock trading of ecosystem services protection; tradable quotas for polluting; private rights on intellectual agrarian property and origins, etc. That would be efficient when the privatization of resources or the introduction (and enforcement) of new rights is not associated with significant costs (uncertainty, recurrence, and level of specific investment are low). That government intervention effectively transfers the organization of transactions into the market and private governance, liberalizes market competition and induces private incentives (and investments) in certain activities (the relevant part in Figure 3). For instance, tradable permits (quotas) are used to control the overall use of certain resources or level of a particular type of pollution[36]. They give flexibility, allowing farmers to trade permits and meet their own requirements according to their adjustment costs and specific conditions of production. That form is efficient when a particular target must be met, and the progressive reduction is dictated through permits, while trading allows the compliance to be achieved at a lower cost (through a private governance). The latter also allows a *market for environmental quality* to develop[37]. In other instances, it would be efficient to put in place regulations for trade and utilization of resources and products – e.g. standards for labor (safety and social security), product quality, environmental performance, animal welfare, norms for using natural resources, introduction of foreign species and GM crops, (water, soil, air, and comfort) contamination, a ban on application of certain chemicals or technologies, regulations for trading ecosystem service protection[38], foreign trade regimes, mandatory eco-training and licensing of farm operators, etc. The large

[36] E.g. manure production quotas in Holland until recently, water abstraction licenses and water rights trading in UK and Australia, nutrition trading schemes in some US river catchments, etc.

[37] Permits can be taken out of market in order to raise the environmental quality above the "planned" (by the government) level.

[38] One can acquire credits for sponsoring protection of carbon sequestration sources or restoration of ecosystem service providers. Banks for handling such credits have been established and conservation companies have even gone public on stock exchanges [Daily *et al.*].

body of environmental regulations in developed countries aims are changing the farmer's behavior and restricting the negative externalities[39].

It makes producers responsible for the environmental effects of their products or the management of a product's uses (e.g. waste). This mode is effective when a general improvement of the performance is desired, but it is not possible to dictate what changes (in activities and technologies) are appropriate for a wide range of operators and environmental conditions (high uncertainty and information asymmetry). When the level of hazard is high, the outcome is certain and the control is easy, and no flexibility exists (for timing or the nature of a socially-required result), then the bans or strict limits are the best solution. However, the regulations impose uniform standards for all regardless of the costs for compliance (adjustment) and give no incentives to over-perform beyond a certain level. In other instances, using the incentives and restrictions of the tax system would be the most effective form for intervention. Different sorts of tax preferences (exceptions, breaks, and credits) are widely used to create favorable conditions for the development of certain (sub)sectors and regions, forms of agrarian organization, segment of population, or specific types of activities. The environmental taxation on emissions or products (inputs or outputs of production) is also applied to reduce the use of harmful substances.

For instance, taxes on pesticides and fertilizers are used in Scandinavian countries and Austria to decrease their application and environmental damaging impact[40].

In Holland, levies on manure surpluses were introduced in 1998 based on levies for nitrogen and phosphorus surpluses above a levy free surplus per hectare. The system creates strong incentives to minimize the leakages (and not just uses), and reduces the flexibility to substitute taxable for non-taxable inputs. However, it is associated with significant administrative and private costs[41].

The environmental taxes impose the same conditions for all farmers using a particular input and give *signals* to take into account the *"environmental costs"* inflicted on the rest of the society.

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[39] For instance, in EU there is a ban for spraying pesticides by airplane, burning after harvest, overhead irrigation of grassland; detailed regulations for nutrition and pest management, water protection against pollution by nitrates, biodiversity and landscape management, licensing for water use, etc. Each country develops a system of "good farming practices" to set up specific codes for sustainable farming.

[40] In Sweden, tax is imposed on manufacturers and importers at a fixed rate for active ingredients, and represents 20% of the fertilizer's prices. In Denmark, a different rate of sales tax is applied on retail prices of chemicals representing an average of 37% of the wholesale prices [ECOTEC].

[41] Annual revenue of 7.3 million Euro versus the administration costs of 24.2 million and compliance expenses at farm levels between 220-580 per farms [ECOTEC].

Taxing is effective when there is a close link between the activity and the environmental impact, and when there is no immediate need to control the pollution or to meet the targets for reduction. Tax revenue is also perceived to be important to maintain budget and activities of special (e.g. environmental) programs.

However, an appropriate level of the charge is required to stimulate a desirable change in farmer's behavior[42]. Furthermore, the nitrogen emission can vary according to the conditions when nitrates are applied, and attempting to reflect this in taxes, may result in complexity and high administrating costs. Besides, the distribution impact of such taxes must be socially acceptable, and the implications for international competitiveness also taken into account.

In some cases, public assistance and support to private organizations is the best mode for intervention. Large agrarian and rural support and development programs have been widely used in all industrialized countries. They allow for a "proportional" development of agriculture, improvement of the farmer's welfare ("income parity"), and, in some instances, undesired effects such as over-intensification, environmental degradation, and market distortions[43].

The public financial support for the environmental actions is the most commonly used instrument for improving the environmental performance of farmers in the EU and other developed countries[44]. It is easy to find a justification for the public payments as a compensation for the provision of an "environmental service" by farmers. All studies show that value placed upon landscape greatly exceeds the costs of running the schemes.

However, the share of farms covered by various agri-environmental support schemes is not significant[45]. That is a result of the voluntary (self-selection) character of this mode which does not attract farmers with the highest environment enhancement costs (most intensive and damaging environment producers). In some cases, the low-rate of farmers' compliance with the environmental contracts is a serious problem[46]. The latter cannot be solved by augmented administrative control (enormous enforcement costs) or introducing a bigger penalty (politically and juridical intolerable measure). A disadvantage of

[42] In Scandinavia, the introduction of such tax brought about a reduced use of pesticide. In contrast, doubling the tax rate in California had no discernable effect on sales [ECOTEC].

[43] Namely, these negative effects led to the fundamental reform of EU CAP in recent years.

[44] In EU, USA, and Japan the public environmental contracts are mostly with the individual farmers while Canada, Australia, and New Zealand direct support to community (collective) actions.

[45] It is 25% of the Utilized Agricultural Area (UAA) in old EU members [EC].

[46] A study in France shows that 40% of the farmers face some difficulties to enforce contracts in their parts of the environmental impact [Dupraz *et al.*].

"the payment system" is that once introduced, it is practically impossible ("politically unacceptable") to be stopped when goals are achieved or there are funding difficulties. Moreover, a withdrawal of the subsidies may lead to further environmental harm since it would induce the adverse actions such as intensification and return to conventional farming.

The main critics of the subsidies are associated with their "distortion effect", the negative impact on "entry-exit decisions" from polluting industry, the unfair advantages to certain sectors in the country or industries in other countries, not considering the total costs (transportation and environmental costs, and the "displacement effect" in other countries). It is estimated that the agri-environmental payments are efficient in maintaining the current level of environmental capital, but are less successful in enhancing the environmental quality [EC].

Often, providing public information, recommendations, training and education to farmers, other agrarian and rural agents, and consumers is the most efficient form. In some cases, a *pure public organization* (in-house production or public provision) will be the most effective as in the case of important agro-ecosystems[47] and national parks; agrarian research, education and extension; agro-meteorological forecasts; border sanitary and veterinary control, etc.

Usually, the specific modes are effective if they are applied alone with other modes of public intervention. The necessity of *combined* intervention (a governance mix) is caused by: the complementarities (joint effect) of the individual forms; the restricted potential of some less expensive forms to achieve a certain (but not the entire) level of the socially preferred outcome; the possibility to get an extra benefits (e.g. "cross-compliance" requirement for participation in public support programs); the particularity of the problems to be tackled; the specific critical dimensions of the governed activity; the uncertainty (little knowledge and experience) associated with the likely impact of the new forms; the practical capability of government to organize (administrative potential to control and implement) and fund (direct budget resources and/or international assistance) different modes; and, not least importantly, the dominating (right and left) policy doctrine [Bachev, 2007].

Besides, the level of an effective public intervention (governance) depends on the kind of the problem and the scale of intervention. There are public involvements which are to be executed at *local* (ecosystem, community, and regional) levels, while others require *nationwide* governance. And finally, there

[47] For instance, in Japan, special (so-called "third sector") public organizations at local level take care of farmland in unpopulated regions.

are activities, which are to be initiated and coordinated at *international* (regional, European, and worldwide) levels due to the strong necessity for *trans-border actions* (needs for a cooperation in natural resources and environment management, for exploration of economies of scale/scale, for prevention of ecosystem disturbances, and for governing of spill-overs) [48] or consistent (national and local) government failures. Very frequently the effective governance of many problems (risks) requires *multilevel* governance with a system of combined actions at various levels involving a diverse range of actors and geographical scales.

The public (regulatory, inspecting, provision, etc.) modes must have built special mechanisms for increasing the competency (decrease bounded rationality and powerlessness) of the bureaucrats, beneficiaries, interests groups and public at large, as well as restricting the possible opportunism (opportunity for cheating, interlinking, abuse of power, and corruption) of the public officers and other stakeholders. That could be made by training, introducing new assessment and communication technologies, increasing transparency (e.g. independent assessment and audit), and involving experts, beneficiaries, and interests groups in the management of public modes at all levels [Bachev, 2007]. Furthermore, applying *"market like"* mechanisms (competition and auctions) in the public projects design, selection and implementation would significantly increase the incentives and decrease the overall costs.

Principally, a *pure* public organization should be used as a last resort when all other modes do not work effectively [Williamson]. The "in-house" public organization has higher (direct and indirect) costs for setting up, running, controlling, reorganization, and liquidation. What is more, unlike the market and private forms there is not an automatic mechanism (such as competition) for sorting out the less effective modes[49]. Here a public *"decision making"* is required which is associated with high costs and time, and it is often influenced by the strong private interests (the power of lobbying groups, policy makers and their associates, and employed bureaucrats) rather than the efficiency. Along with the development of general *institutional environment* ("The Rule of Law") and the measurement, communication, etc. technologies, the efficiency of pro-market modes (regulation, information, and recommendation) and contract forms would get bigger advantages over the internal, less flexible public arrangements [Bachev, 2007].

[48] A recent epidemic of avian infection is a good example in that respect.

[49] It is not rare to see highly inefficient, but still "sustainable" public organizations around the world.

Usually *hybrid modes* (public-private partnerships) are much more efficient than the pure public forms given the coordination, incentives, and control advantages. In the majority of cases, the involvement of farmers, farmers' organizations and other beneficiaries increases efficiency - decreases asymmetry of information, restricts opportunisms, increases incentives for private costs-sharing, reduces management costs, etc. [Bachev, 2007].

For instance, a hybrid mode would be appropriate for carrying out the supply of non-food services by farmers such as the preservation and improvement of environment, biodiversity, landscape, historical and cultural heritages.[50] That is determined by the farmer's information superiority, the strong interlinks of that activity with the traditional food production (economy of scope), the high assets specificity to the farm (farmer's competence, high cite-specificity of investments to the farm and land), and the spatial interdependency (needs for cooperation of farmers at a regional or wider scale), and, not less importantly, – the farm's origin of negative externalities. Furthermore, the enforcement of most labor, animal welfare, biodiversity, etc. standards is often very difficult or impossible at all. In all these cases, stimulating and supporting (assisting, training, and funding) the private voluntary actions are much more effective then the mandatory public modes in terms of incentive, coordination, enforcement, and disputing costs [Bachev, 2004].

Anyway, if there is a strong need for a third-party public involvement, but an effective government intervention is not introduced in a due time, the agrarian "development" would be substantially deformed. Thus, the government failure is also possible and often prevails. In Bulgaria for instance, there has been a great number of bad examples for government under- and over-interventions in agrarian sectors during post-communist transition at this time [Bachev, 2006]. Consequently, primitive and uncompetitive small-scale farming; predominance of over-integrated and personalized exchanges; ineffective and corrupted agrarian bureaucracy; blocking out all class of agrarian transactions (innovation and extension supply, long-term credit supply, and supply of infrastructure and environmental goods); and development of a large informal (gray) sector, all have come out as a result.

[50] Environmental cooperatives are very successful in EU countries like Holland and Finland [Hagedorn].

3.4. STAGES FOR ANALYSES AND IMPROVEMENT OF THE GOVERNANCE

The *analysis* and *improvement* of the governance of agrarian sustainability have to go though the following major steps:

Firstly, an *assessment* needs to be made on the *economic, social, environmental, etc. sustainability* of different agricultural systems (parcel[51], farm, eco-system, regional, national, etc.), and the *existing* and *emerging problems and risks* are to be identified (Figure 6). There are a great number of developed and practically used *holistic systems* for assessing the sustainability level of diverse agricultural systems [Sauvenier *et al*.; OECD, 2008; VanLoon].

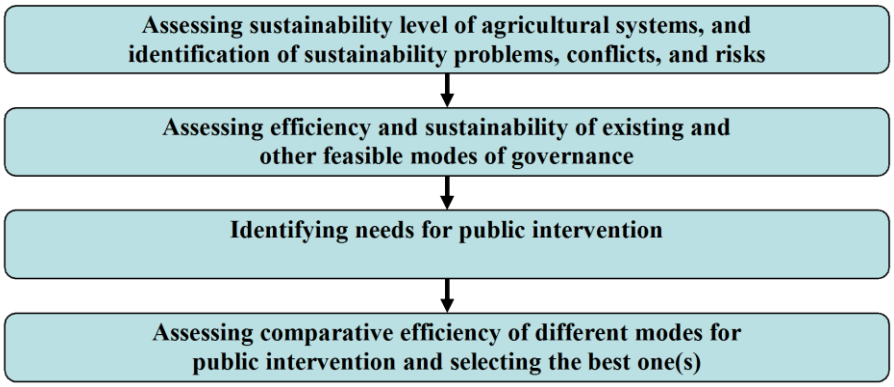

Figure 6. Steps in analysis and improvement of governance of agrarian sustainability.

The identified problems of sustainability could be *internal* for a particular agricultural system or caused by other or larger systems[52]. In any case, a persistence of serious environmental, social and economic challenges (problems, conflicts, risks) is a credible indicator that an effective system of governance is not put in place[53]. Modern science increasingly offers quite precise methods both

[51] Commonly, the *parcel* is defined as the smallest (the lowest level) agricultural system [Sauvenier *et al*.; VanLoon]. However, the parcel management is an *integral part* of the farm governance. That is why detected sustainability problems at parcel level could *only* be tackled with farm and/or higher levels of governance.

[52] In a globalized economy, many of the factors adversely affecting agrarian sustainability are *external* for agriculture - global warming, global financial and economic crisis, regional water crisis, etc.

[53] It shows that needed social, economic, environmental preservation, etc. activity is not carried at an *effective* (socially desirable) scale.

to detect various (ecological, social, etc.) problems and risks associated with the agriculture as well as to improve farming systems in order to mitigate environmental and other hazards caused by agriculture and other (man-made or natural) factors.

Secondly, the spectrum of existing and other practically possible modes of governance (institutions and market, private, public and hybrid forms) employed in agriculture have to be identified, and their efficiency and sustainability assessed.

The evaluation of efficiency of individual modes will show their ability (potential) to deal with various challenges of and contribute to agrarian sustainability at different levels. In addition, the assessment of sustainability of an existing governing structure is necessary to get an idea about its "internal" *potential to adapt* (evolve, modernize, and transform) to dynamic economic, institutional and natural environment, and meet effectively the new (future) challenges and goals of sustainable development[54]. All these would let us know whether (and the extent to which) there will be an efficient response to the sustainability objectives and challenges within the existing system of governance.

Thirdly, the serious deficiencies (failures) in dominating *market, private*, and *public* modes to solve existing and emerging problems (risks and goals) of agrarian sustainability are to be specified, and the needs for a (new) public intervention identified. That step is to include an analysis of the structure and factors of transaction costs at a nationwide (social) scale, which eventually slows down the sustainable growth of agrarian sectors and different regions, and leads to an insufficient and unsustainable use of resources, underinvestment and low productivity in production, lack of innovations, holdup of social cohesion of agrarian and rural actors, etc.

Finally, the alternative modes for public intervention to correct the existing market, private sector and public sector failures have to be identified (e.g. assistance, regulation, property rights modernization, etc.); and their comparative efficiency assessed in terms of contribution to sustainability and minimization of total social costs, and the most efficient one(s) selected.

It is essential to assess the comparative efficiency of practically (technically and socially) possible and alternative forms of governance. Thus, the additional benefits (problems to be solved, risks to be overcome, and new goals to be achieved), the costs, and the modes for a new public intervention must be socially admissible (acceptable). If different forms permit achieving the same goals,

[54] Often some governing modes are highly efficient in "current" economic, social and natural environments, but unable to adapt (sustain) to evolving new (future) challenges of sustainable development.

tackling the same problems, overcoming the same risks, etc., the analysis is to focus on the selection of the mode minimizing the total (implementing and transaction) costs.

Moreover, a form having the same (or less) costs as the alternatives is to be chosen if it provides more benefits or it is (socially, politically, or technically) more preferable than other arrangements. If one of the possible forms provides more benefits at the expense of more costs, then the selection is to be made depending on whether the additional costs for that public intervention are socially acceptable (and feasible) or not. Similarly, if there is a single (only one) mode available for governing a particular intervention (achieving a certain sustainability goal), it would be introduced only if associated implementing *and* transaction costs are socially admissible (and feasible).

At this final stage, our comparative analysis has let us improve the design of the new forms of public intervention according to the specific market, institutional and natural environment of a particular country, region, and sub-sector[55], and in terms of perfection of the coordination, adaptation, information, stimulation, restriction of opportunism, and controlling (in short – minimization of transaction costs) of participating actors (decision-makers, implementers, beneficiaries, and other stakeholders).

What is more, it is also enables us to predict likely cases of new public (local, national, and international) failures due to the impossibility to mobilize sufficient political support and necessary resources and/or ineffective implementation of otherwise "good" policies in the specific economic and institutional environment of a particular country, region, sub-sector, etc. Since the public failure is a feasible option, its timely detection permits foreseeing the persistence or rising of certain problems of agrarian sustainability, and informing the (local and international) communities about associated risks[56].

[55] The effective institutions cannot be "imported," but must be designed for the specific conditions of different countries, regions, sectors, etc. [North].

[56] For instance, most countries have declared a "green recovery strategy" for overcoming the current financial and economic crises. However, only a few of them actually take the appropriate measures and put needed resources in that direction.

PART 2. BULGARIAN EXPERIENCE

Chapter 4

1. ECO-GOVERNANCE DURING TRANSITION AND EU INTEGRATION

1.1. INSTITUTIONAL ENVIRONMENT

There has been a fundamental post-communist transformation of Bulgarian agriculture since 1989 [Bachev, 2006]. New private rights on major natural resources (farmland, forestry, water, origins, etc.) has been introduced or restored, markets and trade liberalized, and modern public support and regulations introduced.

During most of the transition, diverse environmental rights (on clean and aesthetic nature, preservation of natural resources, biodiversity, etc.) were not defined or were badly defined and enforced [Bachev, 2008]. Furthermore, inefficient public enforcement of laws and absolute and contracted rights have been common during the transition now[57]. Besides, out-dated systems of public regulations and control dominated until recently, which corresponded little to the contemporary needs of environmental management. Besides, there was no modern system for monitoring the state of soil, water, and air quality, and credible information on the extent of environmental degradation was not available.

What is more, there existed neither social awareness of the "concept" of sustainable development nor any "need" to be included in public policy and/or private and community agenda. The lack of culture and knowledge of sustainability has also impeded the evolution of voluntary measures, and private and collective actions (institutions) for effective environmental governance.

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[57] Requirements for fighting against corruption and reforming the administration and juridical systems have been underlined by the European Commission (EC) Monitoring Reports and closely scrutinized after EU accession.

In the last few years before the EU accession, the country's laws and standards were harmonized with the immense EU legislation[58]. The Community Acquis introduced a modern framework for the environmental governance including new rights (restrictions) on the protection and improvement of the environment, preservation of traditional varieties and breeds, biodiversity, animal welfare, etc.

However, a good part of these new "rules of the game" are not well-known or clearly understood by the various public authorities, private organizations and individuals [Bachev, 2008]. Generally, there is not enough readiness for an effective implementation of the new public order because of the lack of experience in agents, adequate administrative capacity, and/or practical possibility for enforcement of novel norms (lack of comprehension, deficient court system, widespread corruption, etc.).

In many instances, the enforcement of environmental standards is difficult (practically impossible) since the costs for detection and penalizing of offenders are very high, or there is no direct links between the performance and the environmental impact. For example, although the burning of (stubble) fields has been banned for many years (2000 Law for Agricultural Land Protection), this environmentally harmful practice is still widespread in the country. Subsequently, a permanent deterioration of the quality[59], wasting of the accumulated soil energy through photosynthesis, an extermination of soil micro flora and other habitats, a significant contribution to green-house emissions[60], multiplying instances of forests fires, and a diminished visibility and increase in traffic accidents all come as a result [EEA].

The harmonization with the EU legislation and the emergence of environmental organizations also generates new conflicts between private, collective and public interests. However, the results of the public choices have not always been for the advantage of the effective environmental management. For instance, the strong lobbying efforts and profit-making interests of particular individuals and groups have led to a 20% reduction in numbers and a 50% reduction in the area of initially identified sites for the pan-European network for preservation of wild flora, fauna and birds NATURA 2000.

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[58] The Acquis Communitaire adapted before EU accession (January 1, 2007) contains 26,000 pieces of legislation accounting for 80,000 pages.

[59] Losses reach up to 80% of the organic carbon and nitrogen, and up to 50% of the remaining main nutrition elements in the soil [EEA].

[60] According to estimates, they account for 5,793 tons of methane, 1,883 tons of carbon oxide, 4,344,879 tons of carbon dioxide, and 3,621 tons of nitrogen oxide in 2006 [EEA].

1.2. PRIVATE MODES OF GOVERNANCE

During much of the transition, newly evolving market and private structures have not been efficient in dealing with various environmental issues.

The privatization of agricultural land and other non-land assets of ancient public farms took almost 10 years to complete[61]. During a good part of that period, the governance of a critical agrarian resource (farmland) was in ineffective and "temporary" structures such as privatization boards, liquidation councils, land commissions, etc. Sales and long-term lease markets for farmland did not emerge until 2000, and leasing on an annual base was a major form for the extension of farm size until recently. That was combined with a high economic and institutional uncertainty, and a big inter-dependency of agrarian assets [Bachev, 2006].

Consequently, most of the farming activities have been carried out in less efficient and unsustainable structures such as part-time and subsistence farms, production cooperatives, and huge business farms based on provisional lease-in contracts (Table 1). Furthermore, market adjustments and intensifying competition have been associated with a significant decrease in the number of unregistered farms (74%) and cooperatives (51%) since 1995.

Post-communist transformation has also seen a significant change in the governance of livestock activity. The specialized livestock farms comprise a tiny portion of all farms (Table 2), while 97% of the livestock holdings are miniature "unprofessional farms," breading 96% of the goats, 86% of the sheep, 78% of the cattle, and 60% of the pigs in the country [MAF]. Dominating modes for carrying out farming activities have had little incentives for long-term investment to enhance productivity and environmental performance [Bachev, 2006]. The cooperative's big membership makes individual and collective control on management very difficult (costly). That focuses managerial efforts on current indicators, and gives a great possibility for using co-ops in the best private (manager's) interests. Besides, there are differences in the investment preferences of diverse co-ops' members due to the non-tradable nature of the cooperative shares ("horizon problem"). Given the fact that most members are small shareholders, older in age, and non-permanent employees, the incentives for long-term investment for land improvement, and renovation of material and biological

[61] During the Communist period, farming was carried in few large public farms (agro-industrial complexes, state and collective farms), averaging tens of thousands of hectares and livestock heads. Besides, there were more than 1.5 million small "personal plots" (farms).

assets have been very low. Last but not least important, the "member-oriented" (not-for-profit) nature of the cooperatives prevents them from adapting to diversified needs of members and market demand and competition. On the other hand, small-scale and subsistent farms[62] possess an insignificant internal capacity for investment and small potential to explore economy of scale and scope (big fragmentation and inadequate scale). Besides, they have little incentives for non-productive (environment conservation, animal welfare, etc.) investment.

Table 1. Number, size and importance of different types of farms in Bulgaria

	Public farms	Unregistered	Cooperatives	Agro-firms	Total
Number of farms					
1989	2,101	1,600,000	na	na	1,602,101
1995	1,002	1,772,000	2,623	2,200	1,777,000
2000	232	755,300	3,125	2,275	760,700
2005		515,300	1,525	3,704	520,529
2007		458,617	1,281	5,186	465,084
Share in number (%)					
1989	0.13	99.9			100
1995		99.7	0.1	0.1	100
2000		99.3	0.4	0.3	100
2005		99.0	0.3	0.7	100
2007		98.6	0.3	1.1	100
Share in farmland (%)					
1989	89.9	10.1			100
1995	7.2	43.1	37.8	11.9	100
2000	1.7	19.4	60.6	18.4	100
2005		33.5	32.6	33.8	100
2007		32.2	24.7	43.1	100
Average size (ha)					
1989	2,423.1	0.4			3.6
1995	338.3	1.3	800	300	2.8
2000	357.7	0.9	709.9	296.7	4.7
2005		1.8	584.1	249.4	5.2
2007		2.2	613.3	364.4	6.8

Source: National Statistical Institute and Ministry of Agriculture and Food.

[62] Subsistence and semi-market farms comprise the best part of the farms as almost 1 million Bulgarians are involved in farming mostly on a part-time base and for "supplementary" income [MAF].

Table 2. Number and size of livestock holdings in Bulgaria (November 2007)

Type of holdings	Share farms	Share heads	Share farms	Share heads	Share farms	Share heads	Share farms	Share heads	Average heads
	1-2		*3-9*		*10-19*		*20 and >*		
Dairy cows	79.8	36.1	16	25.2	2.5	11.8	1.6	26.8	2.7
Buffalo cows	69.9	19	17.7	13	7.2	15.5	5.2	52.5	5.1
	1-9		*10-49*		*50 -99*		*100 and >*		
Ewes	85	37.1	12	24.5	2	15	1	23.4	8.6
She-goats	97.1	75.3	2.7	17.4	0.2	4.1	0.1	3.2	2.8
	1-2		*3-9*		*10-199*		*200 and >*		
Breeding pigs	78.8	12.8	14.9	8.8	5.8	21.1	0.5	57.4	7.8

Source: MAF Agro-statistics.

Moreover, there has been no state administrative capacity, nor a political will to enforce the quality and eco-standards in that vast informal sector of the economy.

Likewise, the larger business farms operate mainly on leased land and concentrate on high pay-off investment with a short pay-back period (e.g. cereals and sunflowers). That has been coupled with ineffective outside pressure (by authority and the community) for respecting the official standards for ecology, land use (crop rotation and nutrition compensation), biodiversity, etc. In general, survivor tactics and behavior, rather than a long-term strategy toward farm sustainability, has been common among the commercial farms.

Furthermore, during the entire transition, the agrarian long-term credit market was practically blocked due to the big institutional and market uncertainty, and the high specificity of much of the farm investments [Bachev and Kagatsume]. In addition, newly evolving Bulgarian farming has been left as one of the least supported in Europe[63]. Until 2000, the public aid was mainly in the form of preferential short-term credit for the grain producers and insignificant support to capital investments. That policy additionally contributed to the destructive impact

[63] Estimates demonstrate that the aggregate level of support to agriculture before 2000 was very low—close to zero or even negative [OECD, 2000].

for unbalanced unilateral N fertilization by the biggest producers having access to the programs.

Despite the considerable progress in the public support since 2000 (EU Special Assistance Program for Agriculture and Rural Development – SAPARD and CAP measures), the overall support to agriculture is estimated very little [Bachev and Kagatsume]. In addition, only a small proportion of the farms benefits from some form of public assistance—most of these farms being large enterprises from regions with less socio-economic and environmental problems. Basically, a publicly-supported farm must meet the requirements for good environmental performance. However, the minor amount of actually supported farms, he deficiency of clear criteria for eco-performance, and the lack of effective control have barely contributed to the overall improvement of the environmental situation.

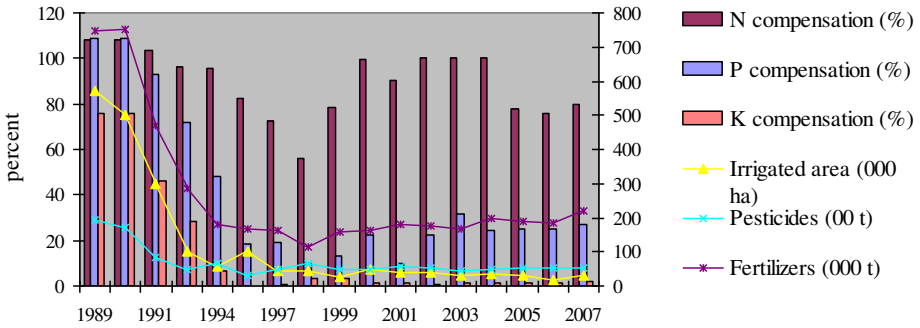
Hence, since 1990, the entire "environmental management" has been left on the farmer's "good will" and the "market signals". Market governance (competition and marginal rule) has led to a sharp decline in all crop (except sunflower) and livestock (except goat) productions[64]. The smaller size and owner operating nature of the majority of farms avoided certain problems of the large public enterprises from the past such as lost natural landscape, biodiversity, nitrate and pesticide contamination, huge manure concentration, uncontrolled erosion, etc. Subsistent and small-scale farming has also revived some traditional (and more sustainable) technologies, varieties and products.

In addition, the private mode has introduced incentives and possibilities for an integral environmental management (including revival of eco- and cultural heritage, anti-pollution, esthetic, comfort, etc. measures) profiting from the inter-dependent activities such as farming, fishing, agro-tourism and recreation, processing, trade, etc. Last but not least, there are good examples for foreign direct investment in cereals, oil crops, and integrated with farming vine and food processing, which introduce modern (western) governance, technologies, quality, labor and environmental standards.

A by-product of dominating "market and private governance" is a considerable de-intensification of the agriculture, and an ease of the general environmental pressure and pollution compared to the pre-reform level. For instance, the total amount of used chemical fertilizers and pesticides has declined considerably, and now their per hectare application represents merely 22% and

[64] For potatoes by 33%, wheat 50%, corn and burley 60%, tomatoes, Alfalfa hay and table grape 75%, apples 94%, pig meat 82%, cattle meat 77%, sheep and goat meat 72%, poultry meat 51%, cow milk 45%, sheep milk 66%, buffalo milk 59%, wool 85%, eggs 45%, and honey 57% [NSI].

31% of the 1989 level (Figure 7). That sharp reduction in chemical use has drastically diminished the risk of the chemical contamination of soils, waters, and farm produce. Consequently, a good part of the farm production has received unintended "organic" character obtaining a good reputation for products with a high quality and safety.



Source: National Statistical Institute and Ministry of Agriculture and Food.

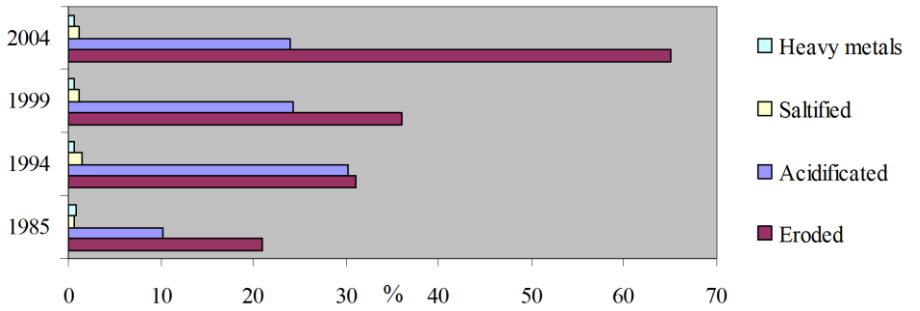
Figure 7. Irrigation, chemical application, and rate of fertilizer compensation in Bulgarian agriculture.

Nonetheless, a negative rate of fertilizer compensation of N, P and K intakes dominate being particularly low for phosphorus and potassium (Figure 7). Accordingly, an average of 23595,4 t N, 61033,3 t P_20_5 and 184392 t K_20 have been irreversibly removed annually from soils since 1990 [MAF]. Furthermore, an unbalance of nutrient components has been typical with application of 5.3 times less phosphorus and 6.7 times less potassium with the appropriate rate for the nitrogen used during that period. Moreover, a monoculture or simple rotation has been constantly practiced by most large operators concentrating on few profitable crops (such as sunflower and wheat). All these practices further contributed to deterioration of soil quality and soil organic matter content.

There has also been a considerable increase in agricultural land affected by acidification (Figure 8). It has been a result of a long-term application of specific nitrate fertilizers[65] and unbalanced fertilizer applications without adequate input of phosphorus and potassium. Currently, almost a quarter of soils are acidified as a percentage of degraded farmland acidified soils reach 4.5% of total lands. After 1994, the percentage of acidified soil began to decrease; however, in recent years there is a reverse tendency along with the gradual augmentation of the use of

[65] Consisting mostly of ammonium nitrate (70-80%) and carbamide (20-30%) [EEA].

nitrates. During the entire period, no effective measures have been taken to normalize soil acidity and salinity[66].



Source: Executive Environment Agency.

Figure 8. Share of de-gradated agricultural lands in Bulgaria.

Erosion has been another major factor for land degradation since 1990 (Figure 8). Due to ineffective management, around one-third of the arable lands are subjected to wind erosion and 70% to water erosion as total losses vary from 0.2 to 40 t/ha in different years[67]. The progressing level of erosion is a result of the extreme weather, but it has been also adversely affected by dominant agro-techniques, deficiency of anti-erosion measures, and uncontrolled deforestation [EEA].

There has been also a sharp reduction of irrigated farmland as merely 2-5% of the existing irrigation network[68] has been practically used (Figure 7). Consequently, the irrigation impact on erosion and salinization has been significantly diminished. However, the decline in irrigation has had a direct negative effect on crop yields and the structure of crop rotation. In addition, irrigation has not been effectively used to counterbalance the adverse effect of global warming on farming (extension of farm season, increased water requirements, and rainfalls) and the further degradation of agricultural land.

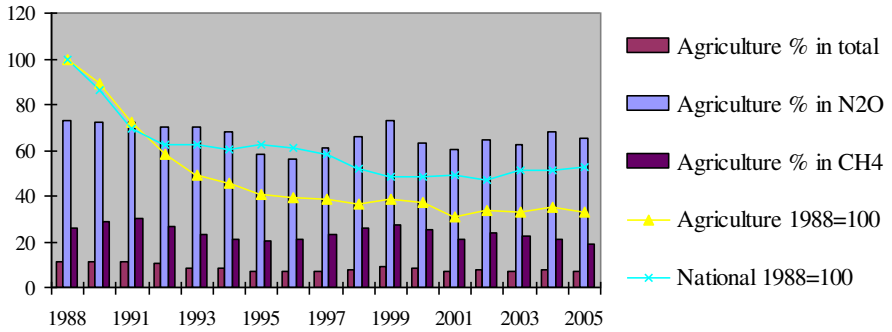
There has been a significant reduction of overall green-house gas (GHG) emissions from agriculture as well (Figure 9). Moreover, the decline in the

[66] For instance, limed acidificated lands comprises far below 2 % of the areas limed until 1990. And no chemical melioration or drainage of salinified land has been effectively implemented [MAF].

[67] Annual losses of earth masses from water erosion are estimated at 136 Mt, while wind erosion deflates between 30-60 Mt. Two-third of the former and almost all of the latter come from the arable land [EEA].

[68] Since 1990, a considerable physical distortion of irrigation facilities has also taken place, affecting 80% of the internal canals [MAF].

sector's contribution has been higher than the national. The N_2O emissions comprise 59% of the total emissions from agriculture and there is a slight enlargement of the share in the last 5 years.



Source: Vassilev et al.

Figure 9. Trend and components of green-house gas emissions from Bulgarian agriculture.

Besides, agriculture has been a major ammonia source accounting for two-thirds of the national emission. After 2000, the majority of NO_2 emissions come from agricultural soils (87%) and manure management and burning of stubble fields (13%). The methane emission from agriculture represents about a quarter of the national. After 2000, the biggest portion of CH_4 comes from fermentation from domestic livestock (72%) and manure management (24%).

The new private management has led to an improved environmental stewardship on owned resources, but has not extended to nature in general (low appropriability of rights). It has been often associated with less concern to the manure and garbage management, over-exploitation of leased and common resources, and contamination of air and groundwater. For instance, the illegal garbage yards in rural areas have noticeably increased[69]. Farms contribute extensively to waste "production" with both organic and industrial materials, leading not only to negative changes in the beauty of scenery, but also bringing about air, soil and water pollution. Pollution of soil and water from industrial activities, waste management, and improper farming activities still presents risk

[69] The official figure for major illegal garbage locations is 4,000 [EEA]. The actual figure is far bigger than the official one.

for the environment and human health[70]. Data shows that in 7% of the tested soils, concentration of pollutants is higher than the contamination critical limits [EEA].

Furthermore, around a quarter of the river length does not meet the normal standards for good water quality [MAF]. Monitoring of water for irrigation shows that in 45% of water samples, the nitrates concentration exceeds the contamination limit value by 2 to 20 folds [MAF]. Nitrates have also been the most common polluter of underground water for the last 5 years[71] with a slight excess over the ecological limit [EEA]. In addition, general levels of pollutants exceeding the ecological limit value for triasine pesticides in underground water, which is a consequence of the increased use of these chemicals, have been reported.

The lack of effective manure storage capacities and sewer systems in the majority of farms contributes significantly to the persistence of the problem. A major part of the post-communist livestock activity is carried out by a great number of small and primitive holdings often located within village and town borders. Merely 0.1% of the livestock farms possess safe manure-pile sites; around 81% of them use primitive dunghills, and 116 thousand holdings have no facilities at all [MAF]. All of that contributes significantly to the pollution of air, water and soils, and disturbs the population's comfort (unpleasant noise and odor, dirty roads, etc.).

There have also been significant degrading impacts of agriculture on biodiversity. According to the official data, all 37 typical animal breeds have been endangered during the last several decades[72] as 6 among them are irreversibly extinct, 12 are almost extinct, 16 are endangered and 3 are potentially endangered [MEW].

Since 1990, a considerable portion of agricultural lands has been left uncultivated for a long period of time or entirely abandoned[73]. The latter has caused uncontrolled "development" of species, allowing development of some of them and suppressing others. Besides, some of the most valuable ecosystems (such as permanent natural and semi-natural grassland) have been severely

[70] Areas of agricultural land industrially polluted by heavy metals have fallen after 1990; they are not significant, and only about 30% of the affected soils need special monitoring [EEA].

[71] Nitrate Vulnerable Zones cover 60% of the country's territory and less than 7% of agricultural land use.

[72] The policy toward intensification and introduction of foreign varieties and breeds during the Communist period and the lack of any policy toward protection of biodiversity afterwards have largely contributed to the degradation of the rich diversity of local plants and animal breeds.

[73] Currently, almost 10% of all agricultural lands are unutilized farmland. In addition, fallow land accounts for 9.5% of arable land. In some years of transition, abandoned land reached one third of the total agricultural land [MAF].

damaged[74]. Part of the meadows have been left under-grazed or under-mowed, and intrusion of shrubs and trees into the grassland took place. Some of the fertile semi-natural grasslands have been converted to cultivation of crops, vineyards or orchards. This has resulted in an irreversible disappearance of plant species diversity.

Meanwhile, certain public (municipal and state) pastures have been degraded by the unsustainable use (over-grazing) by private and domestic animals. In addition, a reckless collection of some valuable wild plants (berries, herbs, and flowers) and animals (snail, snakes, and fish) has led to the destruction of all natural habitats.

Above and beyond, some genetically modified crops have been introduced without an independent assessment of possible hazards for the traditional and organic production and human health, or providing appropriate safeguards and proper information.

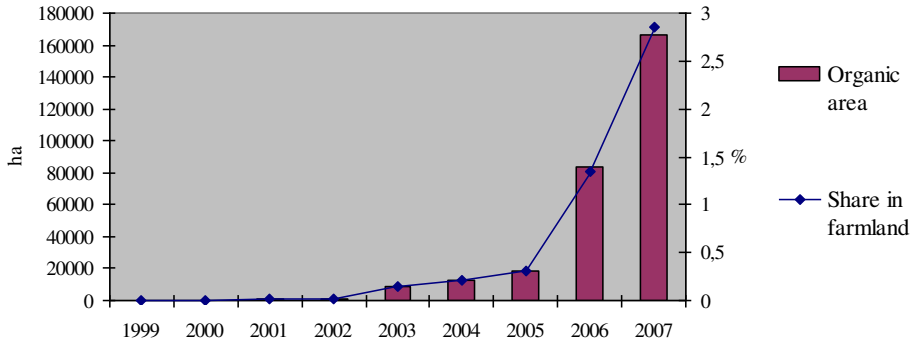
1.3. MARKET MODES

Market-driven organic farming has emerged in recent years in the country (Figure 10). It is a fast-growing approach, but it is restricted to 432 farms, processors and traders, and covers less than 3% of the Utilized Agricultural Area [MAF]. There are only a few livestock farms and apiaries certified for bio-production. In addition, 242677 ha have been approved for gathering wild organic fruits and herbs.

The organic form has been introduced by business entrepreneurs who managed to organize and fund this new venture, arranging needed independent certification[75] and finding potential buyers for the highly specific output. Produced bio fruits, vegetables, essential oil plants, herbs, spices, and honey are entirely for export since only a tiny internal market for organic products exists in the country.

[74] Approximately 20% of the agricultural lands of Bulgaria are lands of High Nature Value [MAF].

[75] A good part of the certification has been done by foreign bodies since until recently no Bulgarian certification institutions existed.



Source: Ministry of Agriculture and Food.

Figure 10. Development of organic farming in Bulgaria.

The slow development of the organic market is not only because of the higher prices of organic products, but is also because of the limited consumer confidence in the authentic character of products and certification[76]. In addition, eco-labeling of processed farm products (relying on self-regulation) has appeared, which has been more a part of the marketing strategy of certain companies rather than a genuine action for environmental improvement.

Since 2001, the assets of public-owned irrigation companies were transferred to the newly-evolving Water Users Associations. However, an expected "boom" in efficiency (quantity and productivity) from a collective management of irrigation activities has not materialized. That is because of the semi-monopoly situation of regional state water suppliers (monopoly terms and pricing), few incentives for water users to innovate facilities and expand irrigation, and still uncompleted privatization of state irrigation assets.

Generally, an initiation, development and maintenance of an organization of a large group is very costly, and such a coalition is not sustainable for a long time ("free rider" problem). In Bulgaria, the evolution of farmers and environmental associations has been additionally hampered by the big number of agrarian and rural agents and their diversified interests (different size of ownership and operation, type of farming, individual preferences, different age and horizon, etc.) [Bachev, 2006].

[76] Numerous fake labeling as organic or traditional products has been detected by the Organization for Consumer Protection and reported daily in the media.

1.4. PUBLIC MODES

Market and private sectors have failed to effectively govern the environmentally-related activities in agriculture and there has been a need for a third-party public intervention. However, the government and local authority involvement has not been significant, comprehensive, sustainable, or even related to the matter [Bachev, 2008]. The total budget of the Ministry of Water and Environment accounts for just 1.5% of the National Budget, and the agricultural sector gets a tiny portion of all public eco-spending [MWE]. Similarly, re-cultivation of de-gradated farmlands by the MAF has been under way recently, but it accounts for merely 200-250 ha per year [MAF].

In the past several years a number of programs have been developed to deal with the specific environmental challenges - National Strategy for Preservation of Biodiversity (1999); National Strategy for Environment (2000); National Plan for Agrarian and Rural Development (2000); National Programme for Limitation of Total Emissions of Sulphur Dioxide, VOC, and Ammonia (2002); National Program for Waste Management Activities (2002); Environmental Strategy for the Instruments of ISPA (2003), National Strategy for Management and Development of Water Sector (2004); National Action Plan on Climate Change (2004); Strategy for Developing Organic Agriculture (2005); National Action Program for Sustainable Management of Lands and Fights against Desertification (2006); National Plan for Agrarian and Rural Development (2007); National Environmental Strategy and Plan (2009), etc.

In addition, national monitoring systems of the environment and biodiversity have been set up and a mandatory ecological assessment of public programs introduced. Nevertheless, the actual eco-policies rest fragmented and largely reactive to urgent environmental problems (natural disasters such as floods, storms, and drought) rather than based on a long-term strategy for sustainable development. Moreover, there is no efficient coordination between different programs and management levels. The programs and action plans are usually developed and executed in a highly centralized manner (by bureaucrats, foreign experts, and profit-making companies) without involvement of independent local experts, stakeholders and the public at large. In addition, there is considerable deficiency in the administrative capacity at local level in terms of staff, qualification, material and financial means. As a result of all of these, inefficiency in priority setting and management (incompetence and corruption) and a minor impact of the public programs prevails [Bachev, 2008].

Moreover, a multifunctional role of farming has not been effectively recognized, a proper system for its assessment (data and indicators) introduced,

and provision of a public service "environmental preservation and improvement" funded by the society. For instance, the measure "Agro-ecology" of the SAPARD was not approved until the middle of 2006 and a few projects have been funded since 2007. What is more, due to the mismanagement and corruption SAPARD (along with other EU funds), it was suspended by the EC in 2008, and a considerable EU funding under that scheme lost.

Neither, the essential public institutions and infrastructure crucial for the sustainable farming development have been built: public system for enforcement of laws, regulations, and contracts does not work well; essential property rights (on environmental resources and biodiversity, special and organic products, GM products and intellectual agrarian property) are not well-defined and/or properly enforced; public support programs are rarely governed effectively and in the best interest of the legitimate beneficiaries; agricultural research is under-funded and can hardly perform its function for innovation and independent expertise; the newly established agricultural advisory system does not serve the majority of farms and include rural development and environmental issues; urgently needed public system for agrarian insurance has not been introduced; crucial agrarian and rural infrastructure (wholesale markets, irrigation, roads, and communications) has not been modernized; public support for initiating and developing farming associations has not been given, etc.

A serious environmental challenge is still caused by the state deficiency in storing and disposing the out-of-dated or prohibited pesticides of the ancient public farms. Currently, those chemicals account for 11079 t and a good proportion of them are not stored in safe places. There are 477 registered abandoned storehouses for such pesticides, situated in 460 locations around the country, and just 38% of them are guarded [EEA]. What is more, as much as 82% of all polluted localities in the country are associated with these dangerous chemicals, and only a tiny portion of them have gone through the entire cycle of examination.

A great number of international assistance projects (funded by the UN agencies, EU, Foreign Governments, NGOs, etc.) have been carried out to "fill the gap" of the national government failures. They either focus on a specific issue (sustainable agriculture, desertification, etc.) or mobilize local actors for sustainable development. These programs introduce western experiences in governance and try to make a difference. However, they are limited in scale and unsustainable in time; in some cases, they are overtaken by the local groups and funding improperly used, and, above all, they make no significant impact.

The endurance of environmental and other challenges demonstrates that an effective system of governance has not been put in place. Subsequently, the

modernization of Bulgarian farms according to the EU (quality, safety, environmental, animal welfare, etc.) standards has been delayed; growth in farms productivity, competitiveness and sustainability severely restricted; and technological, income and eco-disparity between farms of different types, sub-sectors and regions broadened [Bachev and Kagatsume].

Chapter 5

2. ENVIRONMENTAL GOVERNANCE IN CONDITIONS OF EU CAP IMPLEMENTATION

2.1. NEW OPPORTUNITIES AND CHALLENGES

The EU integration and CAP implementation provides new opportunities for Bulgarian farms. The EU funding alone, which agriculture has received from 2007 on is 5.1 times higher than the overall level of support to farming before acceding. For 2007-2009, the EU funds allocated for "agrarian and rural development" are €733 million, for "direct payments" 722 million, and for "market support" €388 million. Besides, Bulgarian agriculture receives funding from the EU Structural Funds and the national budget.

Furthermore, the EU accession introduces and enforces a *"new order"* - strict regulations and control; tough quality, food safety, environmental, etc. standards; and financial support and protection against market instability, etc. The external monitoring, pressure and likely sanctions by the EU, leads to better enforcement of laws and standards in the country. For instance, in 2007 the EC started a procedure for sanctions for not reducing emissions of greenhouse gasses according to the EU Program for Environment and Combating Adverse Climate Changes. In 2008, EC blocked payments for SAPARD and other programs because of a considerable mismanagement and corruption.

What is more, huge EU markets are opened which enhances competition and lets Bulgarian farms explore their comparative advantages (low costs, high quality, specificity and purity of produce, etc.). The novel conditions of market competition and institutional restrictions also give strong incentives (pressure) for new investments for increasing productivity and conforming to higher product, technology and environmental standards.

The larger and business-oriented farms are most sensitive to new market demand and institutional regulations since they largely benefit (or lose) from timely adaptation to new environmental regulations. Besides they have a higher capacity to generate resources and find outside (credit, equity, and public) funding to increase competitiveness and meet new institutional requirements [Bachev, 2006]. The process of adaptation has been associated with appropriate land management and the intensification of production. The latter could revive or deepen some of the environmental problems (erosion, acidification, and pollution) unless pro-environmental governance (public order, regulation, etc.) is put in place to prevent that from occurring.

On the other hand, small-scale producers and most livestock farms are having a hard time adapting to new competition pressure, investment needs, and new food safety, environmental, animal-welfare, etc. standards [Bachev and Nanseki]. Dairy farming is particularly vulnerable since only 1.4% of the holdings with 17% of the cows in the country meet EU quality, hygiene, veterinary and building standards [MAF].

Some of the farms qualified to receive "area based" direct payments from EU. In view of the current (low) level of support, the direct payments augment farm sustainability and give means for adaptation to the new standards. On the other hand, this mode would support less productive structures (like cooperative, smaller-scale, and part-time farms) and non-market forms (subsistence and cooperative farming). As a result, sustainability of these farms will increase – small-scale operations become viable; cooperatives are able to pay rent (almost entirely abandoned during transition); subsistence farming become more profitable, etc.

Furthermore, direct payments cause an increase of farmland price and rent, and thus enlarge costs for land supply in the largest farms. In contrast, smaller-scale operators retain entire subsidies and see their income increased. Subsequently, the transformation of land management to the most effective forms and restructuring of farms is further delayed. In some instances (subsistence and semi-market farms and member-oriented cooperatives), EU funds are used effectively to subsidize food self-supply of population.

However, the EU support unevenly benefits different farms as the bulk of the public subsidies actually go to few farms - the larger operators (agri-firms and cooperatives) specialized in field crops. At the same time, many effective small-scale farms and livestock farms[1] receive no or only a tiny fraction of the direct payments. For instance, in 2008 less than 16% of all farms received area based

[1] Livestock farms are not eligible to receive any direct payments under the "area based scheme".

payments averaging 2226.1 Euro per farm and 50.4 Euro per ha [MAF]. In addition, around 13% of the farms received national top-ups averaging 910 Euro per farm and 203.3 Euro per ha. Typically, the same farms touch both types of payments as farms specialized in field crops receive the largest public support (Table 3). Furthermore, most of the subsidies go to the more developed regions where the biggest farms and utilized farmland are located. That further fosters the disparity in income and efficiency among different farms and sub-sectors.

There are also significant EU funds for rural development exceeding 4.7 times the relevant pre-accession level. This amount of resources lets more and relatively smaller farms get access to public support schemes and invest in modernization of enterprises. Furthermore, new essential activities are effectively funded such as: commercialization and diversification of farming; introduction of organic farming; maintaining productivity, biodiversity; agri-environment of protection, animal welfare; support for less-favored areas and regions with environmental restrictions, etc. All these would help in bringing additional employment and income for farmers and increasing economic and environmental sustainability of farms.

Table 3. Share of EU and national support in Net Income of different Bulgarian farms in 2008 (percent)

Type of farm	Share of subsidies in farms' Net Incomes	
	Current subsidies	*Investment subsidies*
Field crops	63.2	2.1
Horticulture	1.3	1.8
Permanent crops	0.4	2.2
Livestock	0.3	0

Source: MAF Agro-statistics.

Similarly, in the past[2], mostly bigger farms participate in public support programs because they have a superior managerial and entrepreneurial experience, available resources, possibilities for adaptation to new requirements for quality and other standards, potential for preparing and wining projects, etc Besides, despite the strong EU (and internal pressure), it has been impossible to reform the

[2] SAPARD and other public programs benefited predominately large farms, cooperatives and agri-firms [Bachev and Kagatsume]. Likewise, in 2008, the biggest part of funded projects under measure, "Modernization of farms" of Agrarian and Rural Development Program, were for agro-firms (57%) and cooperatives (15%) [MAF].

inefficient system of management of public programs. Consequently, a significant EU funding has been blocked, while other support (such as SAPARD) irreversibly lost.

Therefore, agrarian and rural development funds will probably continue to benefit exclusively the largest structures and the richest regions of the country, more abuses will take place, and CAP support will not contribute to decreasing economic and eco discrepancy between farms, sectors, and regions.

2.3. IMPACT(S) ON GOVERNANCE AND SUSTAINABILITY

The CAP implementation improves the environmental performance of commercial farms. There is a mandatory requirement for farms to "keep the farmland in a good agricultural and environmental status" in order to receive direct payments and participate in other public programs. Moreover, direct payments induce farming on previously abandoned lands, and improve the environmental situation and biodiversity.

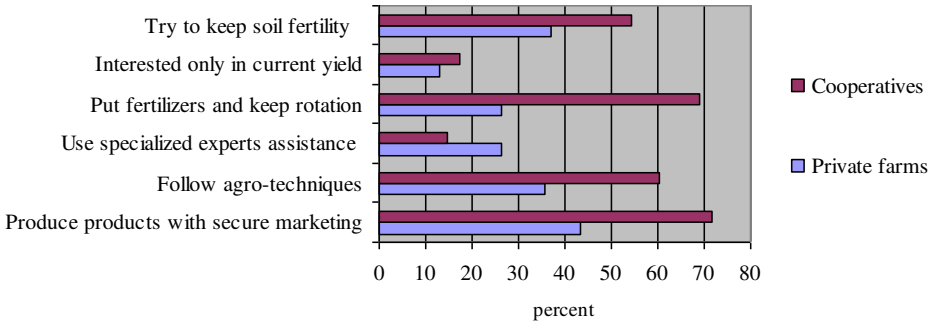
Furthermore, there is a huge budget allocated for special environmental measures (going beyond the "good farming practices"). The National Plan for Agrarian and Rural Development (2007-2013) allocates budget for "preservation of national resources and improvement of countryside" amounting € 623.3 million (27.1% of the total funding). Therefore, a number of farms taking part in various agri-environmental programs will gradually increase in the future[3].

Our recent survey has found that for most farms the "economic" sustainability ("concentration on products with secure marketing") is still the dominant strategy (Figure 11). At the same time, a good portion of cooperatives and most parts of non-cooperative farms do not implement long-term strategies for keeping ecological sustainability through preserving soil fertility, observing crop rotation and agro-techniques requirements, etc.

The CAP measures would positively affect the environmental performance of large business farms and cooperatives. Namely these enterprises (and potential big polluters) are under constant administrative control and severe punishment (fines, losing licenses, and ceasing activities) for obeying new environment, biodiversity, and animal welfare standards. Therefore, they are strongly interested in transforming their activities according to the new eco-norms, making necessary eco-investments, changing production structures, etc. Moreover, larger producers

[3] In 2008, there are only 27,079 approved projects supporting farms from "unfavorable" regions [MAF].

are motivated to participate in special agro-environmental and biodiversity programs since they have lower costs (potential for exploring economies of scale and scope) and higher benefits from such long-term public contracts.



Source: Survey data.

Figure 11. Share of Bulgarian farms implementing different production strategies (%).

The experience of other EU countries demonstrates that some of the terms of the specific contracts for environment and biodiversity preservation, animal welfare, keeping tradition, etc. are all very difficult (expensive) to enforce and dispute. In Bulgaria, the rate of compliance with these standards would be even lower because of the lack of readiness and awareness, insufficient control, ineffective court system, domination of "personal" relations and bribes, etc. Correspondingly, more farms than otherwise would enroll and participate in such schemes (including the biggest polluters and offenders). Subsequently, the outcome of implementation of that sort of instruments would be less than the desirable (namely "European") level.

More to the point, direct costs and lost income for conforming to the requirements of the special programs in different farms vary considerably, and they have unequal incentives to participate. Having in mind the voluntary character of most CAP support instruments, we should expect that the biggest producers of negative impacts (large polluters and those non-compliant with modern quality, agronomic, biodiversity, animal welfare, etc. standards) would stay outside of these schemes since they have the highest environment enhancement costs.

On the other hand, small contributors would like to join since they do not command great efforts (and additional costs) compared to the supplementary net benefit. Moreover, the government is less likely to set up high performance standards because of the perceived "insignificant" environmental challenges, the

strong internal political pressure from farmers, and the possible external problems with the EU control (and sanctions) on cross-compliance. Therefore, CAP implementation will probably have a modest positive impact on the environment performance of Bulgarian farms.

The public support and new public demand give a push to further development of market modes such as organic farming, industry-driven eco-initiatives (eco-labeling, standards, and professional codes of behavior), protected high quality products[4], system of fair-trade, production of alternative (wind and manure) energy at farm, etc. For instance, the significant EU market and lower local costs create strong incentives for investment in organic and specific productions by the large enterprises - farms, partnerships and joint ventures (including non-agrarian and foreign participants). Similarly, new incentives for production of bio-fuel and clean energy would induce development of a new area of farm activity (new sub-sectors) associated with that new public and market demand.

Principally, the small farms have less capacity to put together or find necessary capital and expertise for initiating, developing, certifying and marketing in all these new ventures. Besides, the coalition (development, management, and exit) costs between small-scale producers are extremely high to reach the effective operation level (allowing exploring technological economies of scale and scope or technologically required minimum of inputs). Therefore, the latter either stays out of these new businesses or has to integrate into larger or non-farm ventures. However, assuring the effective traceability of the origin and quality for small farms is very costly and they are not preferable partners for integrators (processors, retailers, and exporters). What is more, the internal market for organic and specialized farm products would unlikely develop fast having in mind the low income of population and the lack of confidence in public and private system of control.

Some economic and/or ecological needs (such as economizing on scale and scope or high interdependency of assets) would continue to bring about a change in size and governance of individual farms and/or evolution of group organizations, co-operations, and joint ventures. For instance, a big interdependency of activities requires concerted actions for achieving certain eco-effects; a high asset dependency between livestock manure (over) supplier and nearby (manure-demanding) organic crop farms necessitates a coordination, etc.

[4] Such as Protected Designation of Origin, Protected Geographical Indication, and Traditional Specialty Guaranteed.

A special governing size and/or mode is also imposed by some of the institutional requirements. For example, a mandatory minimum scale of activities is set for taking part in certain public programs (e.g. marketing, agri-ecology, biodiversity, organic farming, tradition and cultural heritage): signing a 5-year public environmental contract dictates a long-term lease or purchase of managed land, etc. Our recent survey has proved that as much as 41% of the non-cooperative farms and 32% of the cooperatives are in the middle of investigation of possible membership in a professional organization. Producers' groupings are further stimulated by the available new public support (training, advising, and funding) for farmers' associations.

Some of the existing production cooperatives would also profit from their comparative advantages (interdependency and complementarily to individual farms, potential for exploring economy of scale and scope on institutionally determined investments, adapting to formal requirements for support, using expertise, financing and executing projects, not-for-profit character, etc.), and extend their activities into eco-projects, environmental services, eco-mediation between members, etc.

Thus, an immediate result of the new market and public opportunities for getting additional benefits (income and profit) from environmental products and services will be an amelioration of the economic performance and overall sustainability of a number of farms and rural households.

The CAP implementation will push the modernization of farms' structures through widening the variety of contractual and organizational innovations - specific sorts of contracts, new types of producers' associations, spreading vertically-integrated modes, etc. Special forms are also emerging, allowing agents to take advantage of large public programs which specialize in project preparation, management, and execution; invest in "relations capital" or "negative" entrepreneurship; form modes for lobbying and representation; and make coalitions for complying with formal criteria (e.g. minimum size of utilized agricultural area for direct and agro-ecology payments, membership requirements for producers' organizations), etc.

CAP measures and enhanced competition foster the restructuring of commercial farms according to modern market, technological, and institutional standards. A large part of agrarian inputs, technologies, and outputs is increasingly having a "mass" (standardized) character and market transacting dominate at farm gates. There is also a parallel tendency toward specialization of productions for "niche markets" and products with special quality - specific origins, special technologies, special qualities, etc. All of that requires investments with a higher specificity to a particular buyer(s), and "integrated" management of

activity in farming, processing, retailing and exporting [Bachev, 2006]. Besides, some diversification of enterprises into related activities (trade with origins and agro-tourism) for dealing with market risk is to grow. All these bring more new, special modes for private governance such as long-term contracts, collective agreements (codes of professional behavior), trilateral modes (independent third-party certification/control), and "quasi" or complete integration.

In the new market and institutional environment, many livestock farms are less sustainable because of the low productivity and competitiveness and non-compliance with the EU quality, hygiene, animal welfare and eco-standards [Bachev and Manolov].

That is particularly true for the small-scale unregistered producers which dominate the sector (Table 4). What is more, only a third of dairy holdings believe their production capacity corresponds to the modern requirements of competition, productivity, and justification of improvement of environmental performance and animal welfare.

Nevertheless, merely one-seventh of dairy farms have the potential (internal capacity and access to outside sources) to fund the necessary investment associated with the adaptation to new norms and standards.

Our survey of dairy farms has found that the greatest part of unregistered farms believes that CAP measures would have a "neutral impact" on their income, volume and technology of production, investment level, product quality, access to public programs, improvement of environmental care, improvement of animal welfare, development of infrastructure, possibilities for new income generation, and social status of farm households (Table 5). A bulk of firms expects a "positive" effect in all above directions while cooperatives are optimistic for improvement of animal welfare and pessimistic for the impact on income and access to public programs.

Table 4. Share of farms with large and good capacity for adaptation to EU requirements for the dairy sector (percent)

Farms capacity	Unregistered	Firms	Co-ops	Total
Extend of knowledge on new requirements	22.7	63.6	100	38.2
Available skills and knowledge for adaptation	22.7	54.5	100	35.3
Available production capacity	27.3	45.4		32.3
Improvement of quality and hygiene standards	36.4	72.7	100	50.0
Improving animal welfare	31.8	72.7		44.1
Improving environmental performance	31.8	54.5		38.2
Finding necessary investment	9.1	27.3		14.7

Source: survey data,

Table 5. Expectation for impact of EU CAP implementation on your farm (% of farms)

Impact on:	Unregistered		Firms		Total	
	+	-	+	-	+	-
Volume of production	22.7	9.1	36.4	27.3	26.5	14.7
Income of farm	22.7	9.1	45.4	18.2	29.4	14.7
Technology of production	13.6	4.5	54.5	9.1	26.5	5.9
Investment	18.2	4.5	45.4	18.2	26.5	8.8
Product quality	18.2	0	45.4	0	26.5	0
Access to public programs	9.1	4.5	54.5	9.1	23.5	8.8
Improvement of animal care	13.6	0	45.4	9.1	26.5	2.9
Improvement of care for environment	9.1	0	54.5	9.1	23.5	2.9
Development of infrastructure	9.1	0	54.5	9.1	23.5	2.9
Opportunities for new income	18.2	9.1	36.4	9.1	23.5	8.8
Social status of your household	13.6	4.5	45.4	27.3	23.5	11.8

Source: survey data (+) - positive impact; (-) - negative impact.

A few livestock farms will be able to adapt through specialized investment for enlarging and conforming to the new institutional restrictions by the deadline for full compliance in the end of 2009. Meanwhile, the EU and public pressure for enforcement of standards in the commercial sector increases and leads to closure or take-over of a greater part of livestock farms. The related reduction of farms and animals, and improved manure management, is associated with a drop of the environmental burden by the formal sector (less over-grazing, fewer manure production and mismanagement, etc.). We estimated that few subsistence and semi-market farms would undertake market orientation and extend their present scale because of the high costs for farm enlargement and adjustment - no entrepreneurial capital and resources available, low investment and training capability of aged farmers, and insufficient demand for farm products [Bachev, 2006]. Newly-introduced, specific support to “semi-market” farms would have no

considerable impact on subsistence because of the inappropriate criteria[5] and the insufficient level of support. Besides, this measure focuses on less prospective structures (small, semi-subsistence holdings) with low potential for adaptation to volume, quality, safety, animal welfare and environmental requirements, and needs of processors and distributors. Experience has proved that for the first two years of implementation of the measure for "semi-market farms," only a few thousand applications have been actually made (around 5% of the initially projected number of potential beneficiaries). Currently, it is under consideration the redesign of that measure and redirection of funding to other areas where demand is big (e.g. "support to young farmers" and "modernization of farms").

In addition to all these, the authority is practically (technically and politically) impossible to enforce the official standards in that huge, informal (subsistence and semi-market) sector of the economy. Therefore, massive (semi) subsistence farming with primitive technologies, poor food safety, and environmental and animal welfare standards will continue to exist in years to come.

We have already demonstrated that the hybrid modes (public-private and public-collective) are much more efficient than the pure public forms given the coordination, incentives, and control advantages. Moreover, enforcement of most labor, animal welfare, biodiversity, etc. standards is very difficult or impossible at all. That is particularly true for the huge informal sector of the economy. Here individual "punishments" do not work well while overall damages from incompliance are immense.

That is why policies should be oriented to the market orientation of subsistence farms, support and incentives for collective modes, and eco-programs for informal farms and groups. Principally, public support to voluntary environmental initiatives of farmers and rural organizations (informing, training, assisting, and funding) would be much more effective than mandatory public modes in terms of incentive, coordination, enforcement, and disputing costs.

Furthermore, involvement of farmers, farmers' organizations, and interests groups in priority setting and management of public programs at different levels is to be institutionalized in order to decrease information asymmetry and possibility for opportunism, diminish costs for coordination, implementation and control, and increase overall efficiency and impact.

[5] The same criteria (as in other EU countries) for defining "semi-market farms" is used – farms with size of 1-4 European Size Units (1ESU=1200 Euro). However, for the Bulgarian conditions, an income within this range is quite big (above the average for agriculture and other sectors of the economy) to be considered as "semi-market" activity.

All surveys show that many of the specific EU regulations are not well-known by the implementing of authorities and majority of farmers [Bachev, 2008]. What is more, our recent survey indicates that as much as 47% of non-cooperative farms and 43% of cooperatives are still "not aware or only partially aware" of the support measures of CAP and how they are different from the direct payments. Furthermore, as much as 62% of the farms report that they will not apply for such support due to the "lack of financial resources" (26%), "not compliance with formal requirements" (18%), and "clumsy bureaucratic procedure" (17%).

In addition, there are still a number of "blank points" in adaptation of EU regulations in Bulgarian agriculture. For instance, "the whole farm" is a subject of support in agri-environmental measures (such as organic farming and agro-ecology), but its borders are not defined at all in the national legislation. That creates serious difficulties since land and other resources of the majority of farms are considerably fragmented and geographically dispersed.

Above and beyond, most of the farm managers have no adequate training and managerial capability and are old in age with a small learning and adaptation potential. For instance, the average age of the farm manager is 61 and 70% of them are older than 55 [MAF].

The lack of readiness, experience, and potential for adaptation in public and private sectors alike would require some time lag until the "full" implementation of the CAP in "Bulgarian" conditions. The latter will depend on the pace of building an effective public and private capacity, and training of (acquiring learning by doing experience by) bureaucrats, farmers, and other agrarian agents. As a consequence of the internal and external factors, a farm's modernization and adaptation will be delayed, and its competitiveness and sustainability diminished. Moreover, there will be significant inequalities in application (and enforcement) of new laws and standards in diverse regions of the country and sectors of agriculture and in farms of different type and size.

Last but not least important, there is a growing competition for environmental resources between different industries and interests. That push is further overtaking the natural resources away from the farm governance and changing into non-agricultural (urban, tourism, transport, industry, etc.) use. The needs to compete for and share resources would deepen conflicts between various interests and social groups, regions, and even with neighboring states. All that would require a special governance (cooperation, public order, and hybrid form) on local, national and transnational scales to reconcile conflicts in the benefit of an effective environmental management.

2.3. GOVERNANCE OF AGRO-ECOSYSTEM SERVICES

Agro-ecosystems services and their governance are significantly affected by post-communist transformation and EU integration [Bachev, 2009]. We will present challenges in evolution of that important area by analyzing structure, efficiency and prospects of governance of agro-ecosystem services in Zapadna Stara Planina (ZSP) – a mountainous region in North-West Bulgaria.

Agro-ecosystems in ZSP are part of the unique ecosystem of ZSP[6] and provide a wide range of specific services (Figure 12). A great number of agents from and outside the region benefit from and affect the services of these ago-ecosystems – landowners[7], farmers, residents, businesses, visitors, consumers, scientists, and interest groups.

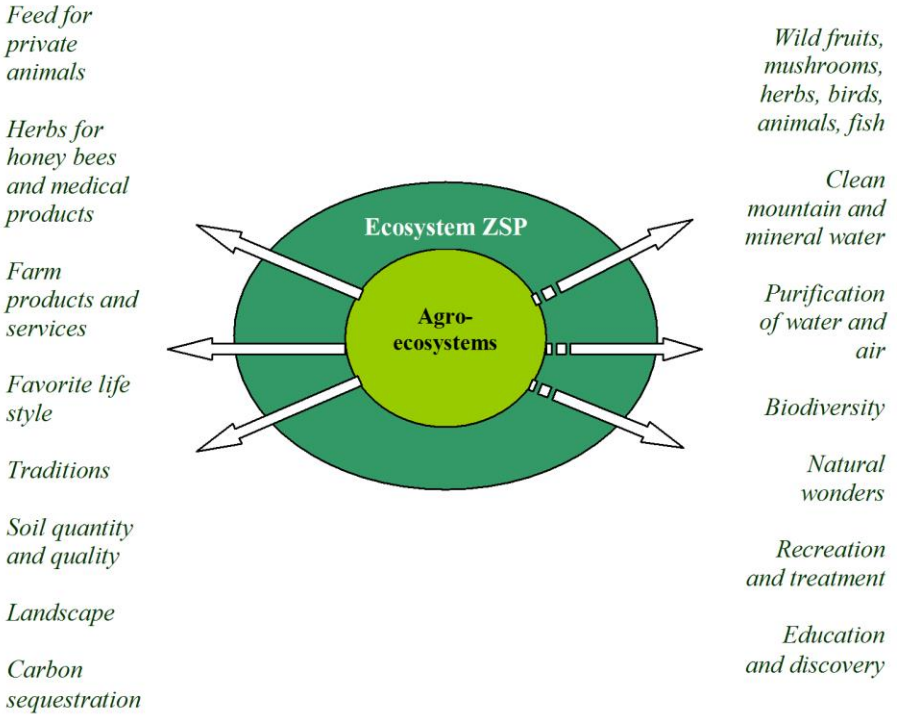


Figure 12. Services of Agro-ecosystems in Zapadna Stara Planina, Bulgaria.

[6] ZSP covers an area of 4043 km2 (2099 km2 in Bulgaria and a 1944 km2 in Serbia) of which 60% is forests and the rest is farmland [Grigorova and Kazakova].

[7] 50% of the pollution in ZSP own agricultural lands [Grigorova and Kazakova].

Approximately 70% of farmland in ZSP comprises meadows and pastures [MAF]. They provide feed for farm and household animals, and create good conditions for the development of grazing livestock (sheep, goats, cattle, buffalo, and horses) and domestic animals (poultry, rabbits, and pigs). In addition, there are plenty of wild flowers and herbs which favor bee-keeping and herbal-honey production, as well as a collection of natural medical plants.

Furthermore, a wide range of farm products are produced in this environment used for the provisioning of the local population and marketing. Some of local farm-based products are well-known for quality, unique taste and original character (strawberries, raspberries, blackberries, berry jams, herb honey, sheep yogurt and cheeses, lamb meat, wool, furs, prunes, and plum brandy) and marketed at regional, national and international markets. Simultaneously, they favor development of related productions and services being an important income source for local populations – (jam, dairy, brandy, and leather) processing, dying wool, weaving and crafts making, on-farm and direct marketing, and agro-tourism.

For many local and temporary residents, interactions with agro-ecosystems are the favorite mode of recreation (part-time or hobby farming or short or longer term visits) or lifestyle (weekend/summer houses).

Local traditions and ethnic culture of *Torlaks* and *Karakachans* are closely related to agro-ecosystems and farming systems – specific agricultural and related products (e.g. Chiprovtsi hand-made carpets), crop varieties and animal breeds, production methods/technologies, festivals, cuisine, and crafts.

The unique shape and quality of the landscape is a critical feature of agro-ecosystems dominated by natural or semi-natural high mountain pastures, riparian meadows, and stony and rocky terrains. All these features of agro-ecosystems attract many visitors from the region, country and abroad.

Next, agro-ecosystems contribute significantly to maintaining and improving soil quality - vegetation cover reducing soil loss and degradation and promoting water infiltration. Furthermore, carbon sequestration is an important service of grasslands, berry bushes, orchards and vineyards, storing considerable amounts of CO2 stock.

Agro-ecosystems also provide combined services with larger ecosystems of ZSP. The great variety of wild fruits, herbs, chestnuts, mushrooms, birds, animals and fish are available and picked up or hunted by the local population and visitors. What is more, some of them are commercially gathered for processing and sells bring additional incomes for around 20% of population [Grigorova and Kazakova].

The ecosystem of ZSP is a source of clean mountain and mineral water used by farmers (animals and irrigation), residents (drinking and household needs), businesses (inputs and bottling) and health centers (balneotherapy) in the region and neighboring areas. Besides, it purifies the water and air and regulates the climate, making the region a favorite destination for tourism, recreation and treatment[8]. Moreover, some of country's most popular natural wonders like the Rocks of Belogradchik[9], Iskar Gorge, and a number of picks, waterfalls, and caves are located in ZSP, enhancing the cultural services of ecosystem.

The territory of ZSP is high with ornithological and botanical importance and is designated as a Pan-European network NATURA 2000 site (Map 1). Maintaining this rich biodiversity is a great service of the ecosystem of ZSP. For instance, in its flora, there are more than 2,000 species of higher plants (among which 12 are Bulgarian and 79 are Balkan endemics[10]), while its fauna comprise more than 180 bird species, more than 50 species of mammals, 26 species of amphibians and reptiles, and many butterfly species of conservation importance [Grigorova and Kazakova]. That increases the educational and scientific services of this unique ecosystem as well.

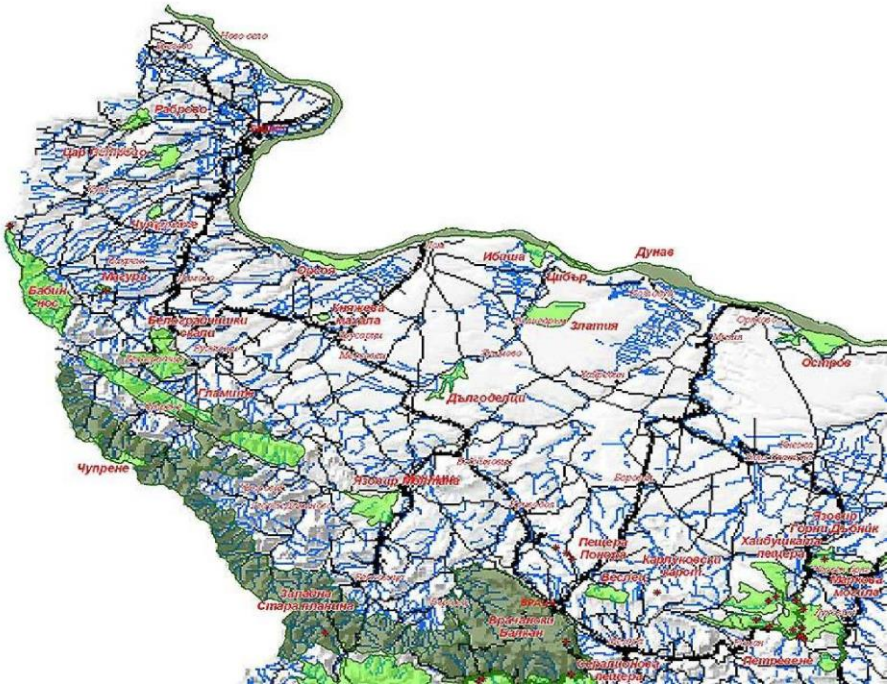
Various *market, private* and *public* modes are used for governing of agro-ecosystem services in ZSP (Figure 13).

Post-communist reforms transferred entire agrarian activity from large public farms into market and private governance. Private management and market adjustments are associated with the domination of small-scale and subsistence holdings (Table 6), sharp decline in crop and livestock (except goat) productions and general de-intensification of activity.

[8] Well-known mountainous resorts Berkovitza, Varshetz, Izketz are located there.

[9] It is nominated to be one of New 7 Natural Wonders of the World.

[10] Besides, hill "Vrashka Chuka" is a worlds-only place of *Eranthis bulgaricus.*



Map 1. Natura 2000 Habitat directive sites (light green color) and Bird directive sites (dark green color).

Market modes	Private modes	Public modes
Informal branding	Voluntary	Environmental regulations
Organic (berry)	initiatives	Eco-information, monitoring, assessment
farming	Long-term	Promotion or joining eco-initiatives (festivals,
Organic apiaries	supply contracts	networks, advertisements)
Organic livestock	(milk, berries)	Designated zones of eco-importance (natural parks,
Organic wild fruits	Vertical	NATURA)
and herbs gathering	integration of	Area-based direct payments
Specific origins	farming into	Leasing out public land for private management
(lamb, cheese,	processing and	Cross-compliance requirement
berries, carpets,	services (shops,	Agro-ecological payments (voluntary contracts)
crafts)	hotels,	Support to traditional and original productions
Organic processing	restaurants)	Support to farms and processing modernization

Figure 13. Modes of governance of agro-ecosystem services in Zapadna Stara Planina.

Table 6. Major characteristics of farms in Zapadna Stara Planina, Bulgaria

Indicator	Value	Indicator	Value
Number of farms	12151	Share of farms with cattle (%)	17.2
Average Utilized Agricultural Area (ha)	*0.997*	*Average cattle per farm*	*2.9*
Share of arable land (%)	33.6	Share of farms with sheep (%)	51.1
Share of cereals (%)	18.4	*Average sheep per farm*	*5.5*
Share of horticulture (%)	4.3	Share of farms with goats (%)	62.7
Share of grassland (%)	58.7	*Average goats per farm*	*2.6*
Share of permanent crops (%)	4.9	Share of farms with pigs (%)	47.2
Share of farms with bees (%)	6.3	*Average pigs per farm*	*1.5*
Average bees colonies per farm	*7.1*	Share of farms with poultry (%)	69.0
		Average poultry per farm	*14.2*

Source: Ministry of Agriculture and Food.

Private ownership introduced better incentives for environmental stewardship while small operational size led to overcoming certain problems of large public enterprises from the past and revived some traditional and sustainable technologies, varieties and products. By-products from this market and private governance have been an overall improvement of the agro-ecosystems services in ZSP. Farm and related products received “organic” character, obtaining a reputation for high quality and safety. The region has become an attractive destination for many local and foreign tourists willing to experience genuine nature, traditional cuisine and lifestyle.

Market-driven organic production emerged in recent years, but it is restricted to a few farms, processors and traders. The country’s biggest producers of organic raspberries and bee-honey are located in ZSP.

A number of effective private modes have evolved and govern relations between farmers, processors, food stores, and consumers. High specificity and capacity dependency are widely safeguarded by cooperation (services and processing), long-term contracts (marketing of milk and organic berries), interlinked organization (milk marketing against free provision of cooling vanes and credit), and compete integration (diversification of farming into processing and agro-tourism). Often, non-agrarian agents (processors, food stores, restaurant chains, and exporters) are driven by market or institutional demand initiates, funds, and integrate eco-farming. That is the case with Danone buying milk from big dairy farms (and enforcing safety, quality, environmental, and animal-welfare standards), a Japanese investor financing organic apiaries and exporting bio-honey, and a leading restaurant chain integrating dairy farming and processing.

Cooperatives are the typical mode having great potential to organize highly specific member's transactions (supply of critical inputs/services, processing, eco-management, and marketing), explore economies of scale and scope, mediate relations between landowners and users, and adapt to requirements of banks and public institutions.

Market and private voluntary, not-for-profit and for-profit forms contribute significantly to the improvement of eco-governance, but their scope is usually restricted to a portion of agro-ecosystems (services). For instance, one fifth of agricultural lands have been abandoned, which has caused an uncontrolled "development" of species, allowing the expansion of some and suppressing others. Furthermore, part of permanent natural and semi-natural meadows have been left under-grazed or under-mowed, and intrusion of shrubs and trees into the grassland took place, putting pressure on priority species (such as *Souslik*) and related chains (*Marbled Polecat*) [Grigorova and Kazakova]. Meanwhile, communal and private pastures close to settlements have been degraded by unsustainable use (over-grazing).

In addition, a reckless collection of certain wild plants (berries, herbs, and flowers) and animals (snails and snakes) have led to the destruction of natural habitats. Erosion has been a major factor for land degradation as a result of inappropriate agro-techniques, deficiency of anti-erosion measures, and uncontrolled deforestation. Damages are further enhanced by the dominating negative rate of fertilizer compensation of N, P and K intakes and the unbalanced application of nutrient components. In addition, the lack of effective manure storage capacities in most farms and modern sewer and garbage collection systems in rural areas bring about air, soil and water pollution, and affect the beauty of the scenery.

What is more, most cooperatives have shown serious disadvantages (ineffective management, low incentives for long-term investment, and small adaptability to members and market needs) and most of them have gone bankrupt in recent years. Similarly, a majority of dairy farms and processors have failed to adapt to tough EU (safety, hygiene, environment, and animal-welfare) standards and have had to cease commercial activity. Finally, private interests of particular individuals/groups have harmed legitimate public rights to ecosystem services due to restricting access, converting to proper use (farm/forest land into construction), or escaping public order on natural resource management.

After the EU accession, new opportunities have appeared to get public support for diverse private and collective activities related to agro-ecosystem services. For instance, between 2007-2013, the National Plan for Agricultural and Rural Development (NPARD) will provide significant funding for area-based and

agro-environmental payments (organic farming, management of agricultural lands with high natural value, traditional livestock, protection of soils and water, and preservation of land-shaft features); modernization of farms, processing and marketing; diversification of activity; infrastructural development; keeping traditions; training, etc. Moreover, requirements for "cross-compliance" (with modern quality, safety, eco, and animal-welfare standards) for receiving public support will be introduced. Funding for projects related to eco-system services is also available from Fund LIFE+, Operational Programs "Environment", "Fishery and Aquaculture", and "Regional Development".

However, implementation of the new public order is not effective because of the lack of agents' awareness and experience, inadequate administrative capacity, and mismanagement. Furthermore, due to restricting criteria[11], complicated procedures and high transacting costs, the majority of farms (small-scale and subsistent holdings) have not been able to participate in diverse support schemes.

For example, less than 5% of all farms from ZSP, comprising 18% of grasslands and 8% of arable land, are registered in Land Parcels Identification System (indicating land eligible for CAP support). From SAPARD, agro-ecological measures benefited less than 100 farms from ZSP, while other supports went predominately to large farms and more developed regions. Up-to-date Program "Environment" funded no biodiversity projects [MWE].

In some cases, enforcement of eco-standards is difficult since costs for detection of offenders are high. For instance, the forbidden practice of burning of (stubble) fields is widespread, causing deterioration of soil quality, extermination of micro-flora and habitats, contribution to green-house emissions, multiplying forests fires, and diminishing visibility [EEA]. Likewise, requirements for the minimum-maximum number of animals on pastures is very difficult to enforce (only 5 % of beneficiaries being subject to inspection).

Thus, implementation of EU common policies would have no desired impact on agro-ecosystem services unless special measures are taken to improve the management of public programs and extend public support to dominating small-scale and subsistence farms.

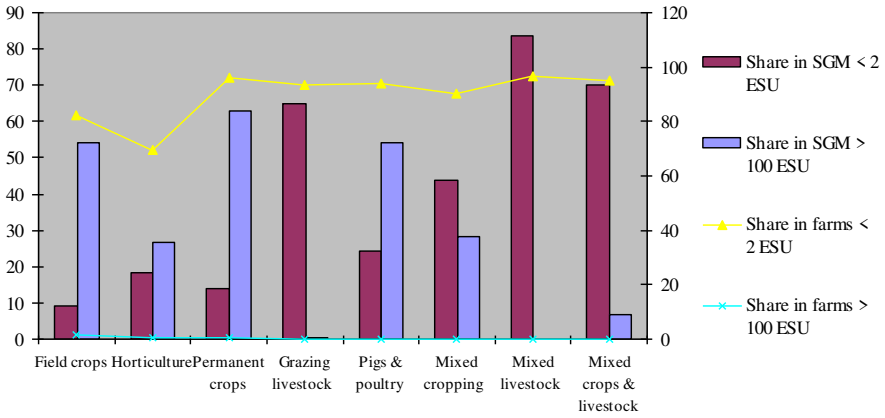
[11] For direct and agro-ecological payment,s minimum farm size is 1 ha (permanent crops 0.5 ha) and 0.5 ha as 0.1 ha parcel size also applies (landless livestock holdings are not eligible). NPARD does not provide support for restoration of abandoned farmland and organic livestock (but forage) production.

Chapter 6

3. SUSTAINABILITY OF FARM STRUCTURES

3.1. SUSTAINABILITY OF BUSINESS FARMS

Large business farms govern a significant part of the activity in cereals, industrial crops, permanent crops, poultry and pigs. Most of them are registered as some type of agro-firm - Sole Traders (58.3%), Companies (35.4%), and Associations (6.3%). Big farms account for a tiny portion of all farms, but concentrate a significant part on UAA (Table 1) and produce the bulk of the Standard Gross Margin (SGM) in major sub-sectors (Figure 14).



Source: Ministry of Agriculture and Food.

Figure 14. Share of farms with SGM smaller than 2 ESU and bigger than 100 ESU in total SGM and farms with different specialization (percent).

Business farms are commonly large specialized enterprises. Most of them were set up as family and partnership organizations during the first years of transition by younger generation entrepreneurs. Specific management skills and "social" status, and a combination of partnership assets (technological knowledge, business and other ties, and available resources) led to the rapid extension of farms through an enormous concentration of (management or ownership of) resources, exploration of economy of scale and size, and modernization of enterprises [Bachev, 2006].

During the long period of institutional and market transformation (unsettled rights on resources, imperfect regulations, huge uncertainty and instability) the personal relations and "quasi" or entirely-integrated modes were extensively used to overcome transaction difficulties. In addition, some state companies were taken over by managers and registered as shareholdings. Joint ventures with non-agrarian and foreign capital have been increasingly set up as well. Business farms have been constantly extending their share in managed agrarian (and related) resources and output taking over smaller farms, incorporating new types of activities and applying new organizational schemes.

Business farms are profit-oriented organizations, and farmer(s) have great incentives to invest in farm-specific (human, material, and intangible) capital because they are the sole owners of the residual rights (benefits) of the farm. Owners are family members or close partners, and the internal transaction costs for coordination, decision-making, and motivation are not high. An increased number of coalitions (partnerships) gives additional opportunity for internal division of labor and profiting from specialization (e.g. full-time engagement in production management, market relations, paper work, technological development, etc.).

The organizational style of a firm is more and more preferred since it provides the opportunity to overcome coalition difficulties (e.g. forming joint ventures with outside capital and disputed ownership rights through the court system); to diversify into farm related or independent businesses (trade, agro-tourism, and processing); to develop firm-specific intangible capital (advertisement, brand names, and public confidence) and its extension into a daughter company, trade (sell or licensing), and transfer through generations (inheriting); to overcome existing institutional restrictions (e.g. for direct foreign investments in farmland and engaging in trade with cereals, vine, and dairy); and to provide explicit rights for taking part in particular types of transactions (such as export licensing, privatization deals, assistance programs, etc.).

Their large size and reputation makes business farms preferable partners in inputs supply and marketing deals. Besides, business farms have giant negotiating

power and effective economic and political mechanisms to enforce contracts. They also possess great potential to collect market information, search for the best partners, use experts and innovation, to meet special (collateral) requirements and bare the risks and costs of failures.

Large farms have strong incentives and potential for innovation – available resources to test, adapt, buy, and introduce new methods, technologies, and varieties, and possibility to hire leading experts and arrange direct supply from consulting companies or research institutes.

In addition, they could explore economy of scale and scope on production and management (e.g. "package" arrangement of credits for many projects and interlinking inputs supply with know-how supply, crediting and marketing). They are also able to invest considerable relation-specific capital (information, expertise, reputation, lobbying, and bribing) for dealing with funding institutions, agrarian bureaucracy, and market agents at a national or even international scale. Furthermore, they have enormous political power to lobby for government support in their best interests. All these give considerable advantages to the business type farming organization.

Under the conditions of non-working court and contract enforcement systems, all critical transactions are governed (controlled and protected) through internal modes. Farm-specific assets such as critical machinery, vineyards, orchards, animals, processing facilities, and adjoining land are all safeguarded by ownership. Low-cost standard (one-season or share rent), lease-in contracts are widely used to govern land supply from tens and hundreds of proprietors. Critical transactions are integrated through extensive labor employment. Besides, core labor (specialists and mechanists) is hired on a permanent basis and special forms such as output-based compensation, interlinking (housing and services), social disbursements, paid holidays, etc. are further used to enhance motivation.

One's own supply (making) rather than outside procurement is typical for the essential services and inputs, which prevent risk from unilateral dependency (opportunism of supplier) or missing market situation. In the case of high asset interdependency (product specificity and quality and quantity dependency),a downstream partner's reciprocal supply of inputs against marketing is applied.

Funding is secured through an effective combination of equity, debt, public and hybrid modes. Standard activities and assets are financed by bank credit since it is easy to arrange a loan. Alternatively, farm-specific investments are financed through private modes – one's own sources, "personal" loans and co-investments. Also, special contract modes are used to mitigate funding difficulties (e.g. shortage of working capital) or to facilitate mutually-dependent relations with buyers and suppliers, such as delayed payments for inputs supply (zero interest

and “loans in kind”), interlinking credit with inputs supply and marketing, leasing or accepting outside investment (“hostage taking” and joint ownership) of long-term assets.

Business farms have been quite successful in benefiting from the various preferential public support programs (SAPARD and State Fund Agriculture), developing good proposals, meeting formal requirements, dealing with complicated paper work, and “arranging” the selection of their projects for modernization and expansion of enterprises, diversifying into related businesses, improving environmental performance, etc. Furthermore they get the greatest share of EU CAP support measures (direct and agro-ecology payments, agrarian and rural development support, etc.) which additionally enhance their efficiency.

In the marketing farm, output and services and classical trade across the market (sells on wholesale market and business with market agents) dominate. Since the main part of a farm’s product has a standardized (commodity) character, market prices and competition effectively govern relations with partners. However, when specificity of output to a particular buyer (processor or retailer) is high (technology, quality, packaging, time of delivery, origin, and site-specificity), then delivery contracts with a respective partner are employed to tailor or protect transactions.

Intra-firm processing and retailing is practiced by some farms. Larger operational size and frequency of transacting provide an economic opportunity for the internal exploration of interdependent assets in farming-processing-retailing. Vertical integration helps protect dependent investments and payoffs from marketing-processed and retail products - e.g. getting the entire profit (value-added and final products), brand name trade, lessened market dependency (easy storage and transportation), etc. Large business farms have significant comparative advantages in terms of adaptability, governance, and productivity. That leads to further redistribution of farming activities in this effective and perspective structure. Accordingly, agricultural is increasingly characterized by the domination of larger and highly competitive business enterprises, which will take over and concentrate most activities in all sub-sectors. Business farms will be sustained in the future by maintaining (enhancing) their comparative advantages in terms of adaptability, governance, and productivity by having greater access to EU markets and opportunities to benefit from the large public support programs for agrarian and rural development.

3.2. SUSTAINABILITY OF COOPERATIVES

The cooperatives concentrate a major part of cereals, oil and forage crops, orchards and vineyards, and they are key service providers for their members and rural agents. The long-term cooperative tradition was an important factor for the emergence of more than 3,000 "new types" of production cooperatives during and after the liquidation of old "cooperative" structures.

Furthermore, often the cooperative was the single form for a farming organization in the absence of settled rights on main agrarian resources and/or inherited high interdependence acquired by individuals' assets [Bachev, 2006]. More than 2 million Bulgarians have received individual stakes in the assets of liquidated ancient public farms. In addition to their small size, a great part of these shares were in indivisible assets (large machinery, buildings, and processing and irrigation facilities). Therefore, new owners had no alternative but to liquidate (sales, consumption, and distortion) or keep them up as a joint (cooperative) ownership.

In many cases, ownership on farmland was restituted with adjoined fruit trees and vineyards, and much of the activities (e.g. mechanization, plant protection, and irrigation) could be practically executed solely in cooperation. Most of landowners happened to live away from rural areas, have other business, be old of age, or possess no skills or capital to start their own farms. In the absence of big demand for farmlands and/or confidence in emerging private farming, new evolving cooperatives have pulled land plots of more than 40% of the novel proprietors in the 1990s.

The cooperative, rather than other formal collective (e.g. firm), mode has been mostly preferred. It allows individual members easy (low costs) entrance and exit from the coalition, preservation of full control on a major private resource such as land, and democratic participation in (and control on) management ("one member-one vote" principle). Besides, the cooperative form gives some important tax advantages such as tax exemption on sale transactions with individual members and on received rent in kind (Double-taxation Law). Also there are possibilities for organization of transactions which are not legitimate for other modes such as credit supply, marketing, and lobbying at a nation-wide scale (Antimonopoly Law).

Moreover, most of the cooperatives develop along with or after the emergence of small-scale and subsistent farming. Namely, "not-for-profit" character and strong member (rather than market) orientation attracted the

membership of many households. Production co-ops have been perceived as an effective (cheap and stable) form for supply of highly specific to individual farm's inputs and services (production of feed for animals; mechanization of major operations; storage, processing, and marketing of farm output), and/or food for household consumption.

The relatively bigger operational size of cooperatives gives them great opportunity for efficient use of labor (teamwork, division, and specialization of work), farmland (cultivation in big consolidated plots, effective crop rotation, and application of chemicals and irrigation), and material assets (exploration of economy of scale and scope on large machinery and equipment and eco-management). In addition, they have superior potential to minimize market uncertainty ("risk pooling" and advertisement), and organize some critical transactions (better access to agrarian credit; stronger negotiating positions in input supply and marketing and facilitate land consolidation through lease-in and lease-out deals; and introduce technological innovations and effective environmental management), to invest in intangible capital (reputation, brand names, labels, and origins), etc. In the situation of "missing markets", the cooperative mode has been the single form for organization of certain transactions in villages and rural areas undertaking bakery, processing, retail trade, etc.

Cooperative activities are not difficult to manage since internal (members) demand for output and services is known and "marketing" secured. In addition, co-ops concentrate on a few highly standardized products (wheat and sunflower) with a stable market and good profitability. All this assists financing, as advance funding of activities commissioned by members is commonly practiced, while producing universal (mass) commodities is easily financed by public programs or commercial credit.

Furthermore, co-ops offer low-cost, long-term leasing of land. That is often coupled with simultaneous lease-out deals as a specific mode for cashing co-ops output or facilitating relations between landlords and private farms. The cooperatives broadly practice an integral organization of critical "services" and inputs supply, benefiting from internal specialization and division of activity. Marketing of risky output is governed by effective delivery contracts or integrated into own processing.

Output-based payment of labor is common, which restricts opportunism and minimizes internal transaction costs. Besides, production cooperatives provide employment for members who otherwise would have no other job opportunities - housewives, pre-retired, or retired persons. They are preferable to the employer since they offer relatively high job security, social and pension payments, days-off and paid annual holidays, and opportunities for professional (including career)

development. Given the considerable transacting benefits, most of the co-op members accept lower than market returns on their resources - lower wages, inferior or no rent for land, and dividends for shares.

There have been some adjustments of size, memberships, and production structure in cooperatives (Table 1). A number of them have moved toward more "business like" governance, applying market orientation, profit-making goals, close and small-membership policy, complex joint-ventures with other organizations, etc. That has been a result of overtaking co-ops' management by younger entrepreneurs, improving the governance, taking advantage of new market opportunities and public support programs, and establishing some of them as key regional players.

At the same time, the traditional cooperative has shown certain disadvantages as a form of farm organization. A large coalition (averaging 240 members) makes individual or collective control on management very difficult and costly. That gives great possibility for mismanagement and/or sets using co-ops in the best interests of managers and groups around them (on-job consumption, unprofitable deals for members, transfer of profit and property, and corruption).

Besides, there are differences in investment preferences of diverse members due to the non-tradable character of cooperative shares. While working, younger members are interested in long-term investments and growth of salaries, income in kind, and other on-job benefits, while older and non-working members favor current gains (income, land rent and dividend). Given the fact that most of the members are older in (pre-retired and retired) age, smallholders, and non-permanent employees, incentives for long-term investment in cooperatives have been very low.

Finally, many co-ops fall short in adapting to diversified (service) needs of members and exploring the potential of inter-cooperative modes (joint ventures and associations). Accordingly, long-term comparative efficiency of cooperatives diminishes considerably in relation to other modes for organization (market, contracts, partnerships, and alliances), and 60% of them have gone bankrupt or ceased to exist after 2000.

Most of the existing cooperatives will be sustained in years to come since they will keep their production and organizational advantages to a large number of petite landowners, rural labor, and small and subsistent farms. What is more, they have a greater potential to explore economies of scale and scope on institutionally-determined investment, adapt to formal requirements for support, and use expertise and finance to execute public projects.

Furthermore, diverse and considerable CAP support measures (direct and agro-ecology payments, investment subsidies, and rural development projects)

give a new opportunity to mitigate the co-op's funding problem. Direct payments for instance, allow the extension of activities and offer attractive rent, while access to investment subsidies lets farms become modernized and enhances competitiveness. Cooperatives have been among the biggest beneficiaries of EU and national direct payments in the fist years after the EU accession. Besides, some environmental, infrastructural, and rural development projects, which require large collective actions and coalition of resources, could be effectively initiated, coordinated, and carried by the existing cooperatives or mix (co-op-private and co-op-public) modes. That will extend and intensify transactions governed by existing cooperatives.

Adaptability of cooperatives to new challenges would be significantly increased through public training of their staffs in business and agro-environmental management, carrying out an effective control on co-ops' activities and providing assistance in farm and cooperative associations.

3.3. SUSTAINABILITY OF SMALL-SCALE FARMS

Unregistered holdings are predominantly small-scale farms comprising the biggest portion of all farms (Table 1 and Figure 14) and agricultural employment[88].

Most private farms evolved after 1989 when agricultural land was restituted and assets of large public farms distributed or privatized. Agrarian reform turned most households into owners of farmland, livestock, equipment, etc. Internal organization of available household resources in one's own farm was an effective way to overcome great institutional and economic uncertainty and minimize costs of transacting [Bachev, 2006].

Private rights on most of the farmlands were not entirely restituted until 2000, making market trade with land very difficult or impossible. Besides, there was "oversupply" of farmland and the effective demand was not immense. In the meantime, many Bulgarians lost their jobs as a result of privatization of public farms and industrial companies. Starting up one's own farm was the most effective (or only) mode for productive use of available resources (free labor, land, and technological know-how). Moreover, a large portion of people was at pre-retired or retired age and had no other job alternatives. For others, farming was a stable, "temporary" or secondary means of employment in conditions of

[88] Accordingly, 95% of the employed persons and 92% of the Annual Work Units of the sector [MAF].

high insecurity in the job market. Diversification into farming took place and now farming is the "sole or major employment" just for a quarter of "engaged persons in agriculture", while, for almost 1 million, it is an "additional source of income" [MAF].

During the transition, market or contract trade of household capital (land, labor, and money) was either impossible or very expensive due to "missing" markets, high uncertainty, risk, asymmetry of information, opportunism in time of hardship, little job opportunities, and security. Moreover, low payoff from outside trade (high inflation, non- or delayed payment of pensions, wages, and rents) was combined with an increased share of the household's food costs. Therefore, internal organization was the most effective way of protecting and getting a return on resources and securing a stable income.

Long-term tradition with "personal plots" during the Communist period, and insignificant costs for acquiring specialized knowledge (information, training, and learning by doing experience) made development costs for owning a farm accessible for everybody. In addition, there has been great (price, quantity, and quality) uncertainty associated with the market supply of basic foods (many new suppliers, no reputation built, poor assortment, insufficient enforcement of quality, and safety standards). For lots of consumers, an internal organization (own production) has been an effective mode to guarantee cheap, stable, safe, and high quality delivery of food. Also, for many Bulgarians, farming activity happens to be a favorable full-time or free-time occupation.

Unregistered farms are not a unified group since there is numerous subsistent and semi-market farms as well as highly-commercialized small to middle-size enterprises. The best part of Bulgarian farms are *subsistent* and *semi- market farms*. According to the last census, less than 39% of unregistered farms reportedly sell products, and, in more than 50% of the cases, those are surplus, not consumed by households [MAF]. Consequently, a significant portion of the entire output of vegetables, fruits, vine, and livestock is for "self consumption".

Governing of small-scale and subsistent farms is not associated with significant costs. Unregistered farms are predominately individual or family holdings, and farm size is exclusively determined by the available household resources – family labor and own farmland and finance. Internal governing costs are insignificant because transactions are between family members (common goals, high confidence, and no cheating behavior dominates) or non-existent (one-person farm). Costs for coordination and organization of activities are not big as primitive technologies are applied; (internal) demand and potential are known; and common objectives, cooperating behavior, and high trust governs relations between family members.

A small collective organization for some activities is also practiced - e.g. a group pasture of animals, common guarding of yields, and common processing and marketing. That allows a partial specialization and division of labor, exploration of economies of scale and scope, and/or makes part-time farming possible. This form is cost-effective since transactions are not complicated, easily controlled, and between close friends, neighbors, and relatives (here mutual trust and self-restriction of opportunism govern relations).

Occasional outside supply of some inputs (seeds and chemicals) and services (veterinary) take place, but they are not connected with significant costs because of highly standardized and not farm-specific character (many suppliers). On the other hand, highly specific to farm transactions, the feed supply for animals, and mechanization and irrigation services are effectively secured through a joint ownership mode such as cooperative or group farming.

"Marketing" of the output for subsistent and semi-subsistent farms is not associated with considerable costs because most of it is for internal household consumption or processing. Exceeds are exchanged with relatives and friends, or sold at local (farmers' or street) markets, to regional middlemen,or processors. In any case, low volume, high frequency, and personal character of the transactions (clientalization) minimize the costs of marketing.

There are also a good number of small-scale *commercial (market-oriented) farms* among the unregistered holdings. They are mainly in labor-intensive productions such as vegetables, tobacco, vineyards, berries, melons, flowers, mushrooms, medicinal and aromatic crops, livestock, sericulture, bee-keeping, and in natural meadows. Those are individual or family enterprises, and farmers have strong incentives to adapt to market demand and increase productivity (through intensification of work and investments in human and material assets) since they own the whole residuals (income). Owning a farm enterprise has been a secure mode for providing (full or part-time) employment for household members (including retired, housewives, and children). Family organization is also an effective form for the intergeneration transfer of farm-specific intangible assets such as know-how, learning by doing experience, reputation, etc.

The extension of farms through outside supply of labor and services is restricted since directing, monitoring, and disputing costs are extremely high in labor-demanding and spatially-dispersed productions. External financing of farming via debt, equity sell-off, or preferential public programs has been out of reach because of the high costs for preparing project proposals; for meeting formal (paperwork, ownership, and co-financing) requirements; and for "arranging" funding. That has been additionally complicated by the big transacting uncertainty, asymmetry of information, and strong specificity

("berried in land") and risk ("mobile character") of investments in agriculture. Thus, possibility for effective farm enlargement and growth in productivity through mechanization and the application of chemicals and innovation is limited by the small internal investment capacities (savings and profit). As a result, outdated technologies, low productivity, and poor quality, labor, animal-welfare, and environmental standards prevail.

Low-cost outside land supply (leasing) is practiced to explore economies of scale on existing assets, and integrate the critical inputs supply (such as forage for livestock). For external supply of indispensable inputs and services, market suppliers or ownership modes (cooperative and group farming) is typically used according to the level of specificity of supply. In many instances, they are not provided at an efficient scale due to the enormous costs of delivery as they are for pesticides, fertilizers, irrigation, extensions, etc.

In some intensive areas (e.g. off-season vegetables and fruits, horticulture, melons), small-scale farming has been quite effective in quality and price competition, bringing good income for households. Profitability of these farms has been especially big when special nationwide organizations exist for marketing (e.g. bee honey); production planning and price support (e.g. quotas and guaranteed prices for tobacco); and inputs supply and marketing (e.g. sericulture).

When symmetrical (capacity, quality, and time of delivery) dependency is in place, then tight marketing or interlinked[89] contracts with downward partners (processors, supermarkets, and exporters) have developed, which govern transactions effectively (in dairy and vegetables). Principally, marketing of output is not associated with considerable costs for commodity and locally-demanded products because of short distance, low volume, high frequency, and personal character of transactions. Besides, some products of small farms (fresh fruits and vegetables and dairy and meat products) enjoy increasing demand because of the low level of intensification (reduced or no chemical use and extensive breeding of animals), high quality, freshness and good taste, authentic local varieties, and bigger confidence of consumers about safety and origin.

Nevertheless, the majority of small commercial farms is vulnerable and has poor mechanisms to protect itself from outside institutional, market, and natural disturbances. Most of them have little ability to meet institutional and market restrictions, bare risks, and safeguard themselves against natural and market hazards (buying insurance, diversifying, or cooperating). All these result in significant income variation for individual farms, (sub) sectors, and different years.

[89] Typically, marketing against credit and inputs and/or extension supply.

A great number of small-scale farms face great transacting difficulties in marketing of their output. Most often they are not preferable partners for big buyers because of small volume and less-standardized character of output, and impossibility (unaffordable costs) to verify quality of products through laboratory tests and certificates. On the other hand, official wholesale markets have been inaccessible for these farms for reason of great distance, high fees, and requirements for volume, special preparation, and certification, etc. Besides, small farms frequently experience problems with meeting contractual terms (none or delayed payment), huge market price fluctuation, (quasi-) monopolistic situations, and missing markets in remote regions.

In order to protect transacting and avoid unwanted exchanges, the primitive forms for risk minimization is commonly used - investment in more universal, but less profitable assets, diversification of production, informal cash and carry deals, direct retail marketing, etc. With the exception of tobacco producers,[90] development of effective collective organizations for risk sharing, price negotiation, marketing, or lobbying for public support has been difficult because of high transacting costs and diversified interests of individual farmers (old-young; larger or smaller size; and specialized or diversified, etc.).

Different fractions of the unregistered farms are with unequal sustainability. Unlike other forms of organization, the life-cycle of a one-person (family) farm is greatly determined by the age of the entrepreneur. Thus, farms are unsustainable when farmers are close to the end of working age, and they have no heir wishing to take up the farm or have more than one successor wanting to get the enterprises[91]. Moreover, incentives for long-term investment in specialized assets for increasing sustainability is low for older farmers since there is no secondary market for farm-specific assets (such as investments in human capital, training, know-how, good reputation, organizational modernization, and positive externalities). For that reason a good number of small-scale commercial farms will operate at low sustainable levels (at present or smaller scales) given that most of farm managers and laborers are old in age[92].

The EU integration and CAP implementation will also foster the restructuring of commercial farms according to modern market, technological, and institutional standards. Most small-scale livestock farms will hardly meet the EU (hygiene, quality, veterinary, phito-sanitary, environmental, and animal welfare) standards

[90] Having a significant political representation and public support.

[91] Disputes between heirs about agricultural lands are widespread and that is a major factor for the big fragmentation of land ownership and farms in Bulgaria.

[92] Farm managers older than 45 and 65 are 85% and 40% accordingly [MAF].

and have to cease the formal commercial activity by the end of 2009. Only a few livestock farms will be able to increase their present size with additional specialized investments in modern technologies, food safety, animal welfare, and environmental protection. That would enhance their capability to compete, meet strict institutional restrictions, and participate in various public support programs. Increased scale of operations will also require some stable forms for governing of marketing such as cooperation or tight contracts with the dairy and meat processing industries.

A process of consolidation and modernization is taking place in some horticultural farms as well. In years to come, market, contract, and institutional uncertainty will be steadily diminishing, while access to public support programs augments with the application of CAP measures. That will further enhance sustainability of smaller-scale, intensive family operations. In some cases, small partnership, group farming or vertical integration by buyer (e.g. processor and exporter) will be used to achieve rapid concentration of capital and labor.

Tobacco farms are located in mountainous and less-developed regions with little farmland and no alternative job opportunities. They will continue to enjoy high public support because of the political power (preferential production or regional support policies). However, due to the global tendency for declining demand and restriction in production (quotas), the restructuring of this sub-sector is inevitable. Thus, modernization and diversification with no significant changes in the mode of organization (specialized small-scale family operation) will occur.

The strong competition will be predictably connected with decreasing the number of small commercial farms of various types as a result of take-overs, joint ventures, failures, or non-market orientations. There will be also a parallel tendency toward specialization into productions for “niche markets” and products with special quality (specific origins, organic products, eggs from freely-bred chicken, meat with low fat levels, and grape for special wines). That will require investments with increasing or high specificity to a particular buyer(s), and “integrated” management of farming, processing industries, food chains, exporting (associated with specification of production technologies, products quality and quantity, time of harvesting and delivery, etc.). Besides, some diversification of enterprises into related activities (trade with origins, agro-tourism, etc.) as modes for dealing with market risk should be expected. And finally, high inter-(cite, capacity, quality, etc.) dependency will require expansion of the modes for vertical integration with downstream industries [Bachev and Nanseki].

Preliminary assessments of likely impact of the CAP implementation in Bulgaria indicate that income, technological, environmental, and social

discrepancies between farms in different sub-sectors and regions, and between small holdings and larger operators, will further augment [Bachev, 2008]. The enhancement of sustainability of small-scale commercial farms would be considerably accelerated through a third-part public involvement in training and extension education, assisting in farm association, and increasing accessibility to various support programs (improving transparency, decreasing bureaucratic procedures, providing preferences for small-scale enterprises, young producers, and disadvantages regions).

At the same time, restructuring a large portion of smaller-scale and subsistent farms will have no positive effect. There has been a significant diminution of institutional and market uncertainty in recent years. However, most of the factors that brought to existence the subsistent and semi-market farming persist – high economic insecurity and unemployment, low income and purchasing power of households, limited demand for agrarian resources and products, and uncertainty associated with market supply of food (freshness, safety, quality, and price). The situation has even worsened as a result of the present global economic and financial crises.

Most subsistent farms have no intention of increasing their size because of other major occupations and income sources, limits of household demands and resources, the advanced age of farmers, etc. Transaction costs to enlarge farms through outside supply of additional land, labor, finance, and marketing are extremely high (no entrepreneurial capital exists). Vast costs for studying and respecting new institutional restrictions (laws, regulations, quality, veterinary, eco, animal welfare, etc. standards) and for establishing "relations" with agrarian bureaucracy (registrations, certifications, and paper works) is also restrictive. Moreover, more than one half of those employed in agriculture are in pre-retirement or retirement age [MAF]. That puts serious restrictions on effective farm adjustment and enlargement - low investment activity and entrepreneurship, limited training capacities, and no alternative employment opportunities.

On the other hand, it is practically impossible for the government to enforce the official standards in that huge informal sector of the economy. What is more, there is a strong political pressure to relax application of EU rules in non-market farm transacting (respect voters' interests). Therefore, the majority of subsistent farms will be highly sustainable in years to come.

CONCLUSION

Deepening the labor specialization and cooperation and exchanges between agents opens up enormous opportunities for socio-economic growth. However, it is also associated with significant transaction costs which might disturb sustainable development. In the traditional (Neoclassical Economics) framework with no transacting costs, there is only one mechanism for the governing of relations between individuals and agrarian development. “Free market prices” (and market competition) effectively coordinate and stimulate the all activity of resource owners, entrepreneurs, and consumers. Accordingly all farms constantly “adapt” to price movements and social demands, being equally efficient and sustainable. Rare cases of market “failures” are also recognized (“negative externalities” and “tragedy of commons”), but a perfect “government intervention” is seen as a remedy. All that leads to an interrupted global sustainable development (maximum growth in productivity and welfare).

In the real economy, there are additional important factors affecting individual choices and agrarian sustainability (namely institutions and transacting costs), and a great variety of effective governing mechanisms. The institutional environment is a crucial factor, which eventually determines the “type” of development and the “level” of agrarian sustainability. The individual agents tend (have) to govern available resources in the most economical way, adapting to market, institutional and natural environment, and minimizing the total (production, consumption, and transaction) costs.

Depending on the personal characteristics of agents and the critical attributes of each activity, there will be a spectrum of effective structure for organization of agrarian resources, activities and exchanges – some will be governed by the “invisible market hand”, others by special contract forms, some by the “visible manager hand”, or within complex hierarchies, others will be supported by a third-party, etc. Accordingly, individual agents will introduce new initiatives,

compete in the market place, contract private arrangements, cooperate with others (competitors, vertical partners, and interested parties) to take advantage of market, technological, institutional and natural opportunities (and restrictions), and achieve their particular goals.

Consequently, at any given period of time, farms and agrarian organizations of various types and size would persist (sustain) in agriculture - subsistent, family, cooperative, corporative, hybrid, etc. However, the sustainable development does not exclude a fundamental modernization of farming structures – size adjustment, transformation, coalition, and disappearance of certain farms.

Our new framework helps us better understand the factors for sustainable development and the "government's role" as well. The analyses of transaction costs identify an immense range of "market failures" associated with unspecified or badly specified property rights; inefficient systems for enforcement of absolute and contracted rights; high uncertainty and dependency of activity; and low appropriation of rights. The economic agents deal with market deficiencies developing different non-market forms for effective governance (contracts, internal modes, collective actions, etc.). Nonetheless, the private sector also "fails" to safeguard individual rights and carry out certain activities on an effective scale. That is particularly true for human and eco-rights, technological and infrastructural development, management of non-renewable resources, environmental conservation activity, etc. Thus, there is a strong need for a third-party public involvement in market and private transactions though institutional modernization, assistance, regulation, hybrid or public organization.

However, diverse forms of public interventions are with unequal efficiency and the most efficient one is to be selected taking into account the overall transaction costs and contribution to sustainable development. What is more, at the present stage, most public interventions increasingly require concerted actions (multilateral and multilevel governance) at local, regional, national, transnational, and global scales. Nevertheless, "government failure" is also possible and inappropriate involvements, under or over-regulations, mismanagement, corruption, etc. are widespread around the world. Agrarian sustainability is significantly compromised when the market and the private sector fails, and no effective public intervention takes place - imperfect institutional structure is not reformed, delayed or bad government interventions prevail, fruitless international assistance dominate, and needed global governance is not established.

The comparative institutional and transaction costs analysis of the environmental governance in Bulgarian agriculture has let us specify the driving factors for the emergence and persistence of environmental problems (risks), and makes a more realistic forecast about the eco development. Contemporary

development of agriculture is associated with specific (and quite different from other European states) environmental challenges, with some of them reaching up to the point of no or limited management. That has been a result of the specific institutional and governing structure evolving in the sector during the past 20 or so years.

Our analysis also shows that implementation of the common EU policies is having unlikely results in "Bulgarian" conditions. In short and medium term, it will enlarge income, technological, social and environmental discrepancy between different farms, sub-sectors and regions. In the longer-term, environmental hazard(s) caused by the agricultural development will enlarge unless effective public and private measures are taken to mitigate the existing environmental problems. What is more, the specific structures for effective governance of farming (such as subsistence farming, production cooperatives, small-scale commercial farms, and large business firms) will continue to dominate in years to come. Nevertheless, a significant improvement of public (government, EU, etc.) interventions is needed in order to enhance the sustainability of prospective farms and sustainable agrarian development. More specifically, implementation of EU common policies would have no desired impacts (on socio-economic development, regional and sectoral discrepancies, flows of agro-ecosystem services, etc.) unless special measures are taken to improve management of public programs, and extend public support to dominating small-scale and subsistence farms.

The identification of efficiency, complementarities, and sustainability of different modes of environmental governance has a substantial importance for the amelioration of public policies, business strategies, and individual's and collective actions. Firstly, it helps anticipate possible cases of market, private sector, and public (community, government, and international assistance) failures, and designs appropriate modes for public intervention. In particular, it facilitates the formulation of specific policies and institutional framework to overcome the existing environmental problems, safeguards against the possible eco-risks, and avoids the severe environmental challenges in other developed countries. Next, it could assist individual, business, and collective actions, and organizational modernization in the agrarian sphere for successful adaptation to changing economic, institutional and natural environments.

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